SLV-X90
RMT-V90

SERVICE MANUAL

ME Model

Remote commander RMT-V90 is available as a unit, but as individual parts the battery case lid of commander is only available.

SPECIFICATIONS

System

Format	VHS standard
Video recording system	Rotary 2-head helical scanning system
Audio recording system	Monaural
Video signal	PAL/MESECAM/NTSC$_{3.58}$/ NTSC$_{4.43}$
Tape speed	PAL/MESECAM SP: 23.39 mm/sec LP: 11.70 mm/sec NTSC SP: 33.35 mm/sec LP: 16.67 mm/sec EP: 11.12 mm/sec
Maximum recording time	PAL/MESECAM SP: 240 minutes with E-240 LP: 480 minutes with E-240 NTSC SP: 160 minutes with T-160 EP: 480 minutes with T-160
Fast-forward and rewind time	Approx. 4 min. 15 sec. (with T-120)
Audio frequency response	80 Hz - 10 kHz
Distortion	Less than 3.5%
Wow and flutter	Less than 0.35%

Tuner Section

Tuner system	39-position voltage system tuner
Channel coverage	See page 9.
Antenna	75 ohm antenna terminal for VHF/UHF
RF converter output	UHF channel 30 to 39

Inputs and Outputs

Input	VIDEO IN: phono jack 1.0 V $^{+1.0}_{-0.5}$ V (p-p) 75 ohms, unbalanced, sync negative
Output	VIDEO OUT: phono jack 1.0 V (p-p) ±0.2 V (p-p) 75 ohms, unbalanced, sync negative
Input	AUDIO IN: phono jack More than 50 kilohms, –20 dBs (0 dB = 0.775 V rms)
Output	AUDIO OUT: phono jack Load impedance less than 10 kilohms, –8 dBs

MICROFILM

VHS VIDEO
CASSETTE RECORDER

SONY®

Timer Section

Clock	Quartz locked
Time indication	24-hour indication
Timer setting	8 programs for 1 year max.
Power back up	Back-up duration: approx. 1 hour
Tape counter	Linear time counter

General

Power requirements	110 - 240 V AC, 50/60 Hz
Power consumption	32 W
Dimensions	430 × 90 × 358.5 mm (w/h/d) (17 × 3 5/8 × 14 1/8 inches)
Weight	Approx. 6.2 kg (13 lb 11 oz)

Remote Commander RMT-V90

Remote control system	Infrared control
Power requirements	3 V DC, two R6 batteries
Dimensions	61 × 18 × 175 mm (w/h/d) (2 1/2 × 23/32 × 7 inches)
Weight	Approx. 100 g (4 oz) (not including batteries)

Accessories Supplied

Remote Commander RMT-V90 with two R6 batteries	(1)
75-ohm coaxial cable with DIN type connector	(1)
AC plug adaptor	(1)

Design and specifications are subject to change without notice.

English

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet.
Refer servicing to qualified personnel only.

Caution
Television programs, films, video tapes and other materials may be copy righted.
Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

Section Title Page

SECTION 1. GENERAL

Precautions ... 5
Location and Function of Parts and Controls ... 5
Connections ... 7
Date and Clock Setting ... 7
Adjusting the TV ... 8
Color System ... 8
Presetting the Active Channels in Your Area ... 9
Handling Video Cassettes ... 10
Playback ... 11
Various Playback Modes ... 13
Recording TV Programs ... 14
Use of the Tape Counter ... 14
Timer-Activated Recording ... 15
Quick Start Recording ... 18
Index Function ... 18
Time Search Function ... 19
Tape Editing ... 20

SECTION 2. DISASSEMBLY

2-1. Removal of Upper Case ... 21
2-2. Removal of Bottom Plate ... 21
2-3. Removal of Front Cabinet ... 21

SECTION 3. DIAGRAMS

Circuit Board Locations ... 22
Overall Wiring Diagram ... 23
System Control & Servo Circuit Basic Block Diagram ... 25
Audio Circuit Basic Block Diagram ... 27
Video Circuit Basic Block Diagram ... 29

SECTION 4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

AD-1 Board Audio Circuit Diagram ... 32
PW-1, 2 Board Power Supply Circuit Diagram ... 32
CP-1 Board (AD-A) Audio Circuit Diagram ... 33
CP-1 Board (PW-A) Power Supply Circuit Diagram 33
CP-1 Board (VD-A) Video Connection.Input Select/VD-1 Board Video Signal Process/VD-2 Board Video C Signal Process Circuit Diagram ... 35
TB-1 Board Terminal Circuit Diagram ... 38
CP-1 Board (CV-A) RF Converter Connection Circuit Diagram ... 38
VP-1 Board Video Pre-amp Circuit Diagram ... 41
CP-1 Board (SY-A) System Control Circuit Diagram ... 45
Mechanism Connection Circuit ... 47
CP-1 Board (SV-A) Servo Circuit Diagram ... 48
CP-2 Board (SV-B) Auto Tracking Circuit Diagram ... 52
CP-2 Board (TM-B) IR Cord Interface Circuit Diagram ... 53
TM-1 Board Display, Timer Tuning Control/TM-2 Board Switch & VR Circuit Diagram ... 54
CP-1 Board (TM-A) Tuning Control Circuit Diagram ... 56
CP-1 Board (TN-A) Tuner IF Connection Circuit Diagram ... 59
TN-1 Board Circuit Diagram ... 60
TN-2 Board Circuit Diagram ... 62

SECTION 5. MECHANISM SERVICE TECHNICAL INFORMATION

1. Outline of Mechanism ... 63
   1-1. Full Loading Mechanism ... 63
2. Description of Mechanism Operation
   2-1. Basic Operation Mode of Mechanism ... 65
   2-2. Description of Mechanism Drive ... 66
      2-2-1. Tape Loading Mechanism ... 70
      2-2-2. Pinch Roller Pressing Mechanism ... 71
      2-2-3. Operation of Brake Control Plate ... 72
      2-2-4. Brake Control Mechanism ... 73
      2-2-5. Brake Lock Release Mechanism ... 74
   2-3. Reel Table Drive
      2-3-1. Reel Table Drive Mechanism ... 76
      2-3-2. Reel Table Drive Clutch Lock and Release Mechanism ... 78
   2-4. Front Loading Drive Selection Mechanism ... 80
   2-5. Cassette Holder Mechanism
      2-5-1. Components ... 84
      2-5-2. Description of Cassette Holder ... 85
3. Mechanism Control
   3-1. Mode Arrangement ... 86
   3-2. Mode Detection Switch ... 86
   3-3. Consideration to Full Loading ... 87
4. Mechanism Maintenance and Checking
   4-1. Periodic Checking and Maintenance Items and Service Jigs ... 88
      4-1-1. Periodic Check Items ... 88
      4-1-2. Cleaning ... 89
      4-1-3. Service Jigs ... 90
   4-2. Mode Selector (VHJ-0050) Handling Instructions ... 91
      4-2-1. Part Names ... 91
      4-2-2. Connection ... 92
      4-2-3. Handring ... 92
5. Mechanism Dismantling and Reassembling ... 94
   5-1. Mechanism Main Unit ... 94
   5-2. Cassette Holder Mechanism
      5-2-1. COMPL Cassette Mechanism ... 95
      5-2-2. Gear Bracket Ass'y ... 96
      5-2-3. Cassette Drive Gear (Right) ... 97
      5-2-4. Cassette Drive Gear (Left) ... 98
      5-2-5. FL Start Switch ... 99
      5-2-6. T-Top Sensor, T-End Sensor ... 100
   5-3. COMPL Motor Bracket
      5-3-1. COMPL Motor Bracket ... 101
      5-3-2. Loading Motor ... 102
   5-4. Tape Loading Mechanism
      5-4-1. Main Parts of the Tape Loading Mechanism ... 104

Section Title Page

5-4-2. Mode Cam ... 106
5-5. COMPL Head Bracket (ACE Head) ... 107
5-6. Pinch Roller Pressure Mechanism ... 108
5-7. Brake Mechanism
  5-7-1. Sub Take-up Brake Ass'y ... 109
  5-7-2. Supply Brake Ass'y and Take-up Brake Ass'y ... 110
  5-7-3. Tension Lever Ass'y and Band Holder Ass'y ... 111
  5-7-4. Capstan Brake Ass'y ... 112
5-8. Reel Table Drive Mechanism
  5-8-1. Supply Reel Ass'y and Supply Reel Gear ... 113
  5-8-2. Take-up Reel Ass'y ... 114
  5-8-3. Take-up Reel Gear ... 115
  5-8-4. Reel Pulley and Friction Gear Ass'y ... 116
  5-8-5. COMPL Clutch ... 117
  5-8-6. Clutch Change Lever and Clutch Lever Ass'y ... 118
5-9. Capstan Motor ... 119
5-10. Fixed Guide, FE Head Lever Ass'y
  5-10-1. Entrance side Fixed Guide and FE Lever Ass'y ... 120
  5-10-2. Impedance Roller, FTE Head ... 121
  5-10-3. Exit side Fixed Guide ... 122
5-11. Drum Section
  5-11-1. Drum Motor (rotor, stator) ... 123
  5-11-2. Drum Unit ... 124
  5-11-3. Upper Drum ... 125
5-12. How to Proceed when the Cassette cannot be Removed ... 128

6. Mechanism Adjustment
  6-1. Operating the Mechanism with no Cassette Inserted ... 129
  6-2. Reel Table Height Adjustment and Torque Check
    6-2-1. Reel Table Height ... 130
    6-2-2. Torque Check ... 131
  6-3. Tension Pole (Back Tension Guide) Position Adjustment and Back Tension Torque Check
    6-3-1. Tension Pole (Back Tension Guide) Position Adjustment ... 132
    6-3-2. Back Tension Torque Chack ... 132
  6-4. Tape Path Adjustment ... 133
    6-4-1. Preparations for Adjustment ... 133
    6-4-2. Adjustment by Visual Observation after Guide Roller, Fixed Guide or COMPL Head Bracket Replacement ... 134
    6-4-3. Entrance Side Fixed Guide (S) Height Adjustment ... 135
    6-4-4. Guide Roller Adjustment ... 136
    6-4-5. Exit Side Fixed Guide (T) Adjustment ... 137
    6-4-6. COMPL Head Bracket (ACE Head) Adjustment ... 137
    6-4-7. Checking after Adjustment ... 138

SECTION 6. ELECTRICAL ADJUSTMENTS

1. Circuit Board Locations
  1-1. Main Boards ... 139
  1-2. Location for Tape Path Adjustment ... 139
2. Electrical Adjustment
  2-1. Preparation
    2-1-1. Equipment ... 140
    2-1-2. Set-up ... 140
  2-2. Servo Circuit Adjustment (CP-1 PCB) ... 141
  2-3. Video Circuit Adjustment (CP-1 PCB and VP-1 Assy) ... 144
  2-4. Audio Circuit Adjustment (CP-1 PCB) ... 145

SECTION 7. EXPLODED VIEWS

7-1. Cabinet & Chassis Parts ... 146
7-2. Mechanism Section (1) ... 147
7-3. Mechanism Section (2) ... 148
7-4. Mechanism Section (3) ... 149

SECTION 8. ELECTRICAL PARTS LIST ... 150

HARDWARE LIST ... 159

SECTION 1
GENERAL

This section is extracted from instruction manual.

Precautions

On safety

- Operate the unit only on 110V - 240 V AC, 50/60 Hz.
- Should anything fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it will not be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- The unit is not disconnected from the AC power source as long as it is connected to the AC power outlet, even if the unit itself has been turned off.
- The nameplate indicating operating voltage, power consumption, etc. is located on the rear of the unit.

On installation

- Allow adequate air circulation to prevent internal heat build-up.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, such as microwave ovens or large loud speakers.
- Do not place any heavy object on the unit.

On operation

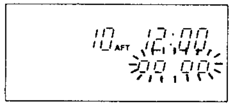
- When the unit is not in use, turn the power off to conserve energy and to extend the life of the unit.
- Remove and store video cassettes after recording or playback.
- Store the cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

On moisture condensation

If the unit is brought directly from a cold to a warm location, moisture may condense on the video head drum. In this condition, the tape may adhere to the head drum and cause serious damage to the head. To avoid damage caused by moisture condensation, be sure not to leave a cassette inside the compartment when the unit will not be used. When the unit is first installed, or when it is moved from a cold to a warm location, wait for about 30 minutes before operating it so that its temperature becomes identical to the room temperature.

If moisture condensation is present

The dew mark (0000) appears in the display window and the unit will not operate.



Leave the unit until its temperature reaches the room temperature and the indicator will disappear.

On cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or a soft cloth slightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

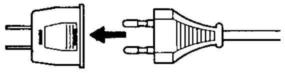
On repacking

Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.
If you have any question about this unit, contact your Sony service facility.

On color system

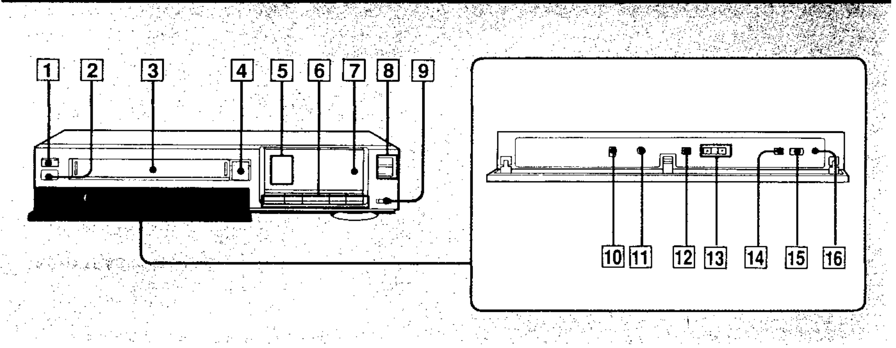
- This unit is designed to receive programs based on the PAL (I, B/G and D/K), SECAM (B/G and D/K) and NTSC3.58 color systems and to record and play back in these systems, plus NTSC4.43.
- Tapes recorded with the French SECAM color system can be played back on this unit but the picture displayed will be in black and white. It is not possible to receive French TV broadcasts with this unit.

Use of the supplied AC plug adaptor
If the plug does not fit into the wall outlet, use the supplied AC plug adaptor.



Location and Function of Parts and Controls

Front Panel



1 ⏻ **ON (power ON/stand by) switch and indicator**

2 **Remote sensor**

3 **Cassette compartment**

4 ⏏ **EJECT button**

5 **Color system indicator**
Indicate the color system of the received signal.

6 **Tape transport buttons**
■ STOP, ◀◀ REW (rewind), **▶ PLAY, ▶▶ FF** (fast-forward), **II / ▶◀ PAUSE/STILL**

7 **Display window**

8 **PROGRAM +/– button**

9 **● REC (record) button**

10 **COLOR SYSTEM SELECT switch**
Selects the color system.

11 **SHARPNESS control**
Use to adjust the sharpness of the picture if necessary. Normally set the control at the center detent position.

12 **REC (recording) MODE button**
Press to select the recording tape speed: SP or LP for PAL system and SP or EP for NTSC system.

13 **TRACKING/FINE TUNING ▼/▲ button**

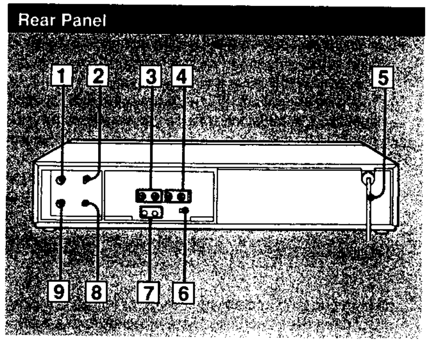
14 **TUNER PRESET button**

15 **NEXT button**

16 **ALL CLEAR button**
When the malfunction occurs, press this with the pencil or similar object.
When this button is pressed, all memorized data (for time, date, timer setting and tuner presetting) will cleared and "88:88" will blink in the display window.

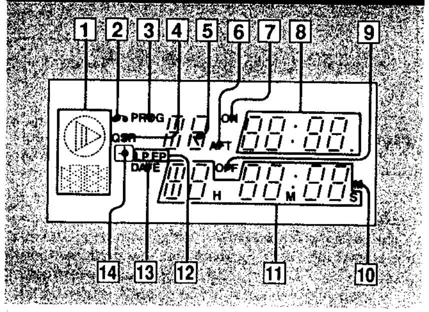
Location and Function of Parts and Controls

Rear Panel



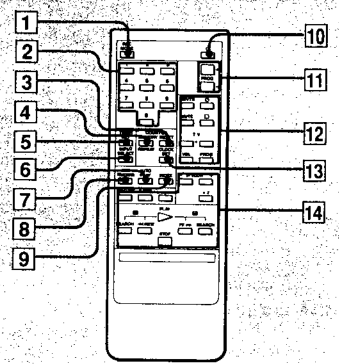
1. **AERIAL IN connector**
   Connect the aerial cable.
2. **TEST SIG. (signal) switch**
   Set to ON to obtain the test pattern for adjusting the TV so that it can receive the signal from the recorder.
3. **LINE IN VIDEO/AUDIO jacks (phono type)**
4. **LINE OUT VIDEO/AUDIO jacks (phono type)**
5. **AC power cord**
6. **TV SYSTEM selector**
   B/G: for PAL B/G or SECAM B/G
   I: for PAL I
   D/K: for PAL D/K or SECAM D/K
7. **PAL/MESECAM STILL V-LOCK (vertical lock) control**
   If a vertical jitter appears in the SP or LP still picture mode, adjust this control until the picture is stable.
8. **RF CHANNEL selector**
   If there is interference on the factory preset channel for RF output and the signal of the VTR cannot be displayed clearly on the TV screen, adjust this selector.
9. **AERIAL OUT connector**
   Connect to the aerial input of the TV receiver using the supplied cable.

Display Window



1. **Mode display**
2. **Cassette indicator**
3. **PROG (program) indicator**
   Appears when setting the timer for the timer-activated recording.
4. **QSR (quick start recording) indicator**
   Appears while the VTR is performing quick start recording.
5. **Program number**
6. **AFT (automatic fine tuning) indicator**
7. **ON (on-time) indicator**
8. **Current time/tracking position indicator**
   Indicates the current time. Also indicates the timer-activated recording start time.
   When adjusting tracking, indicates the tracking position.
9. **OFF (off-time) indicator**
10. **M (memory) indicator**
11. **Linear tape counter**
    Used also to indicate the timer-activated recording end time.
12. **Tape speed indicators**
13. **DATE indicator**
14. **⌚ (timer stand-by) indicator**
    Appears while the VTR is waiting for the turn-on time of timer recording.

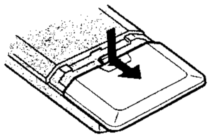
Remote Commander



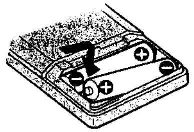
1. **REC (recording) MODE button**
   Press to select the recording tape speed: SP or LP for PAL system and SP or EP for NTSC system
2. **Number buttons**
3. **COUNTER RESET button**
4. **COUNTER MEMORY/REPEAT button**
5. **TIMER SET button**
6. **INPUT SELECT button**
   Press to select the sources to be recorded.
7. **AUTO PLAY button**
8. **AUTO TRACKING button**
9. **INDEX/GO TO button**
10. **⏻ (power on/stand by) button**
    Used only for the VTR.
11. **PROG (program) button**
12. **Buttons for operating a TV**
    TV/VIDEO: for selecting the input signal
    MUTE (muting): for muting the sound immediately.
    To restore the sound, press again.
    ⏻ (power stand by), ○ (power on),
    VOL (volume) +/–, PROG (program) +/–
13. **CLOCK SET button**
14. **Tape transport buttons**
    II PAUSE, ● REC and the recording auxiliary button (right side), **I▶ SLOW** +/–, × 2, **▶ PLAY,**
    ⏪/⏩ **SEARCH** (reverse/forward), **◀◀ REW** (rewind),
    ▶▶ FF (fast-forward), **■ STOP**

Battery Insertion

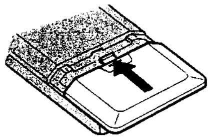
1 **Open the lid.**



2 **Insert two R6 (size AA) batteries with the polarity lined up correctly.**



3 **Close the lid.**

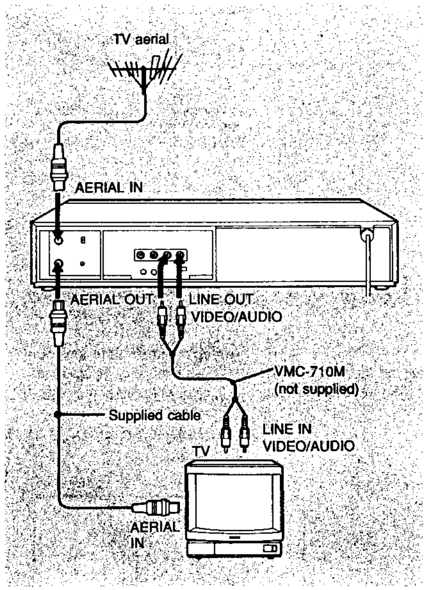


Notes on the handling of batteries
- With normal operation, the batteries will last for approximately 6 months.
- If the Commander will not be used for a long period of time, remove the batteries to avoid possible damage from battery leakage.

Preparations

Connections

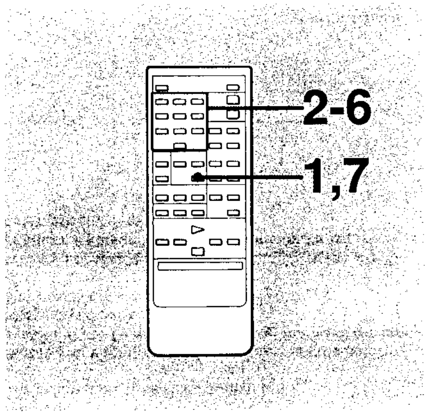
- Turn off the power of the unit and TV.
- Do not connect the AC power cord until all of the connections are completed.
- Connect firmly since a loose connection may cause picture distortion.


TV aerial
AERIAL IN
AERIAL OUT
LINE OUT
VIDEO/AUDIO
VMC-710M
(not supplied)
Supplied cable
LINE IN
VIDEO/AUDIO
TV
AERIAL
IN

If your TV is equipped with video/audio input jacks, connect it to the VTR's LINE OUT VIDEO/AUDIO jacks to view a higher quality picture. To watch the playback picture, set the TV/VIDEO input selector on the TV to VIDEO.

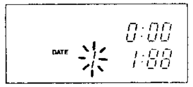
Date and Clock Setting

When the VTR is first connected to the wall outlet and the power is turned on, "88:88" will blink in the display window.

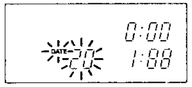


Example: To set to17:30 April 20, 1991

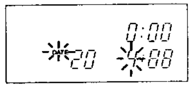
1 **Press CLOCK SET.**


DATE
0:00
1:88

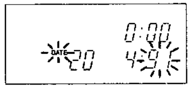
2 **Set the day.**


DATE
20
0:00
1:88

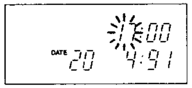
3 **Set the month.**


DATE
20
0:00
4:88

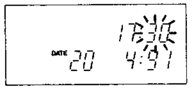
4 **Set the year.**


DATE
20
0:00
4:91

5 **Set the hour.**


DATE
20
17:00
4:91

6 **Set the minutes.**


DATE
20
17:30
4:91

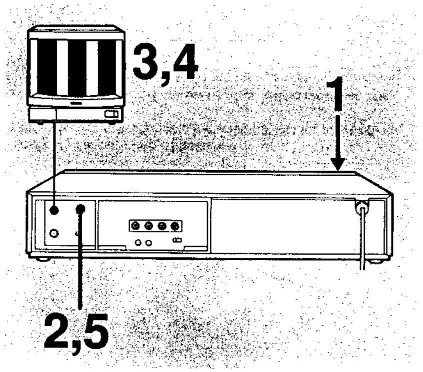
7 **Press CLOCK SET simultaneously with a time signal.**

When a one digit number is set
Press "0" first, and then the desired number.

To correct the date and clock
1 Press CLOCK SET on the Commander.
2 Press PROGRAM (PROG) +/– until the number to be corrected blinks.
3 Correct the number with the number buttons.

Adjusting the TV

If you have connected your VTR and TV using only the aerial connector, one of the television program positions must be adjusted to receive the VTR's playback signal. If the connection of the TV and VTR is made by other means, skip this step.



1 **After making the connections, press ⏻ ON on the front.**

2 **Set TEST SIG to ON.**
The test signal is transmitted on a channel between UHF channels 30 and 39.

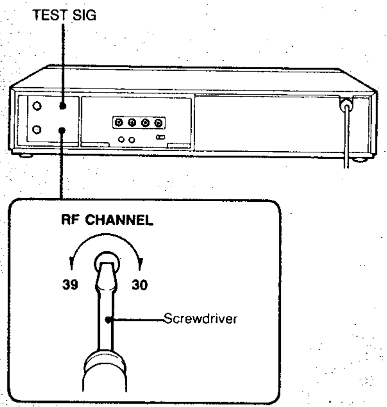
3 **Turn on the TV and select a program position which is not being used to receive a TV station.**

4 **Tune the channel until you see a clear test pattern on the TV screen and you hear a continuous tone.**

5 **Set TEST SIG to OFF.**

Whenever you use the video recorder, you should set the TV to the program position selected in this adjustment.

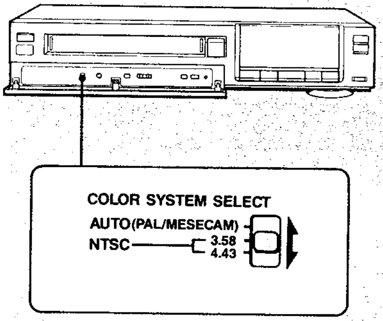
If the test pattern is not free of disturbance



1. Reset TEST SIG to OFF.
2. Adjust the channel of the TV to a channel between UHF channels 30 to 39 so that the TV screen shows no picture and so that no sound is heard.
3. Set TEST SIG to ON.
4. Turn RF CHANNEL slowly until you see an undistorted test pattern on the TV screen.
5. Set TEST SIG to OFF.

Color System

Setting the Video Signal



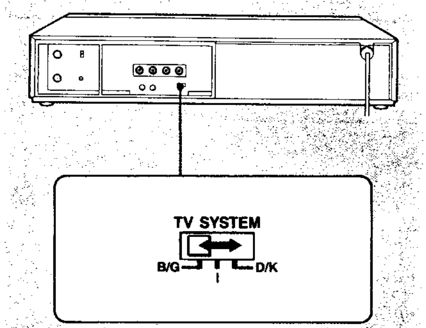
The unit receives programs based on the PAL B/G, PAL I, PAL D/K, SECAM B/G and SECAM D/K.

Before you begin recording, set the color system of the TV and VTR according to that of the program to be recorded.
The indicator of the selected system lights.

Before you begin playing back a tape, set the color system of the TV and VTR according to that of the tape to be played back.
The indicator of the selected system lights.

When you set COLOR SYSTEM SELECT to the AUTO position, PAL and MESECAM color signals are automatically detected.

Setting the Signal from AERIAL OUT Connector



Set TV SYSTEM according to the TV to be used.

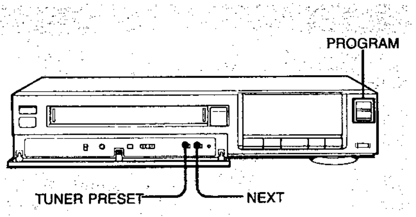
B/G: for watching on a TV for PAL B/G or SECAM B/G.
I: for watching on a TV for PAL I.
D/K: for watching on a TV for PAL D/K or SECAM D/K.

Notes
- There is no need to set TV SYSTEM for NTSC system.
- If you do not know the TV system used, set TV SYSTEM to the position at which audio can be heard. Normal audio cannot be heard if TV SYSTEM is set to the incorrect position.
- If your TV does not conform to the color system of the program to be recorded or the tape to be played back, you cannot view the program to be recorded or played back.

Channel Coverage

SYSTEM	AREA	RECEIVING CHANNELS			OUTPUT SETTING BY RF CHANNEL SCREW	
		VL	VH	U	PRESET	ADJUSTABLE
PAL B/G	Western Europe	2 — 4 X — Z	S1 — S10 5 — 12 S11 — S20	21 — 69	36	30 — 39
	Turkey, Kuwait, U.A.E., Oman, Syria, Jordan	2 — 4	5 — 12	21 — 69		
	Australia	1 — 5	5A — 11	21 — 65		
	Indonesia	2, 3	4 — 11	21 — 69		
PAL I	United Kingdom, Hong Kong	—	—	21 — 69	36	30 — 39
	Ireland	A — C, S1, S2	D — G, H, J S3 — S20	21 — 69		
	South Africa	—	4 — 13	21 — 69		
PAL D/K	China	1 — 5	6 — 12	13 — 56	24 — 25	22 — 26
SECAM B/G	Saudi Arabia, Iran, Iraq, Libya, Egypt, Morocco, East Germany, Greece	2 — 4	5 — 12	21 — 69	36	30 — 39
SECAM D/K	East Europe, Soviet Union	1 — 5	6 — 12	13 — 56	24 — 25	22 — 26
NTSC 3.58	USA	2 — 6 A-8 — A-6, A-5 — A-2	7 —13 A — W	14 —78	34	26 — 38
	Japan	1 — 3	4 — 12	13 — 62	33	25 — 37

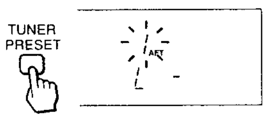
Presetting the Active Channels in Your Area



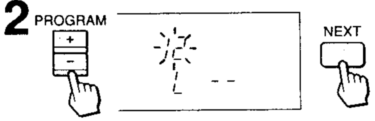
Before you begin

- Turn on the VTR and the TV.
- Make sure that the TV is set to the correct program position for the VTR.

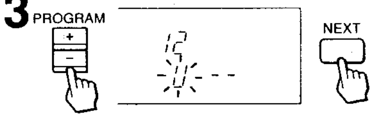
Presetting the Active Channels

1 

Press TUNER PRESET.

2 

Press PROGRAM +/– until the desired program position number appears in the display window. Then press the NEXT button.

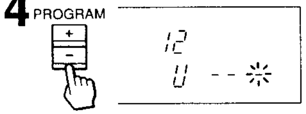
3 

Press PROGRAM +/– until the desired band indicator appears in the display window.

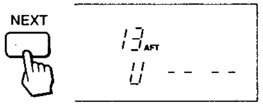
L:VL
H:VH
U:U

Then press NEXT.

- For the band indicator and the corresponding channels, see page 11.
- "S" also will appear at the band indicator position. "S" should be selected to erase unwanted program position. See page 13.

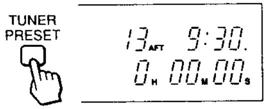
4 

Press PROGRAM +/–.
A channel being used for a broadcast is found automatically.
If the channel is not the desired one, press PROGRAM + or – again.

5 

Then press NEXT.
The selected channel is preset to the selected program position.

Repeat steps 2 to 5 to preset other channels to other program position.

6 

Press TUNER PRESET again.
The display will return to the normal display.

Selecting TV Program positions

Keep pressing PROGRAM +/– until the desired station is tuned in.
For lower-numbered program positions, press "–", and for higher-numbered program positions, press "+".

Fine-tuning a weak station

Normally, the automatic fine-tuning function works when a station is tuned in. (The AFT indicator appears in the display window.)
If the picture of a particular channel is not acceptable, proceed as follows.

1 **Select the unsatisfactory station by pressing PROGRAM + or –.**

2 **Press TUNER PRESET.**

3 **Press TRACKING/FINE TUNING ▼/▲ until the best possible picture and sound are obtained.**
The AFT indicator is turned off.

4 **Press TUNER PRESET.**

Erasing Unwanted Program Positions

After presetting TV channels to the program positions, you can designate unwanted program positions so that the program positions will be skipped when you search for the channel with PROGRAM +/–.

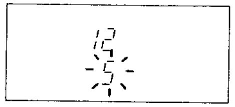
1 **Turn on the VTR and the TV.**

2 **Press TUNER PRESET.**

3 **Press PROGRAM +/– until the program position number to be skipped appears in the display window.**

4 **Press NEXT.**

5 **Press PROGRAM +/– until "S" appears and blinks at the band indicator position in the display window.**



6 **Press NEXT.**

7 **Repeat steps 3 to 6 to designate another program position to be skipped.**

8 **Press TUNER PRESET.**

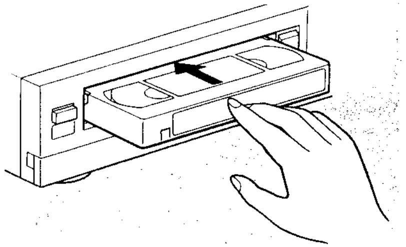
Cancelling the skip function

Preset again the TV channel to the program position which has been set to be skipped.

Handling Video Cassettes

Inserting a Cassette

Insert the cassette by gently pressing the center of the back of the cassette.
The power will be turned on automatically.



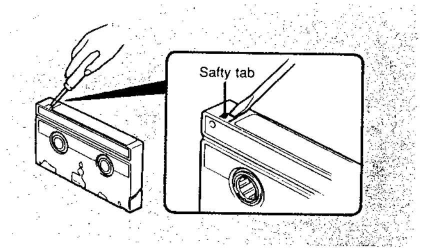
Ejecting a Cassette

Press ≙ EJECT.
When the power is off and ≙ EJECT is pressed, the VTR is turned on automatically and the cassette is ejected. After which, the power is turned off automatically.

Note
While the VTR is in recording mode, press ■ STOP to stop recording and then press ≙ EJECT.

To Avoid Erasing a Recorded Tape

When a new recording is made on a previously recorded cassette, the old recording will be erased automatically. To avoid accidental erasure, break off the safety tab using a screwdriver or similar tool.



To re-record a cassette whose safety tab is broken off
Cover the slot with a piece of plastic tape, where the safety tab has been removed.

Maximum Recording Time of a Tape

Select the tape speed with REC MODE before recording. During playback, the tape speed automatically changes according to the inserted cassette.

PAL

Cassette tape	REC MODE setting	
	SP mode	LP mode
E-30	30 min.	1 hr.
E-60	1 hr.	2 hrs.
E-90	1 hr. 30 min.	3 hrs.
E-120	2 hr.	4 hrs.
E-150	2 hrs. 30 min.	5 hrs.
E-180	3 hrs.	6 hrs.
E-195	3 hrs. 15 min.	6 hrs. 30 min.
E-210	3 hrs. 30 min.	7 hrs.
E-240	4hrs.	8 hrs.

NTSC

Cassette tape	REC MODE setting	
	SP mode	EP mode
T-30	30 min.	1 hr. 30 min.
T-60	1 hr.	3 hrs.
T-120	2 hrs.	6 hrs.
T-160	2 hrs. 40 min.	8 hrs.

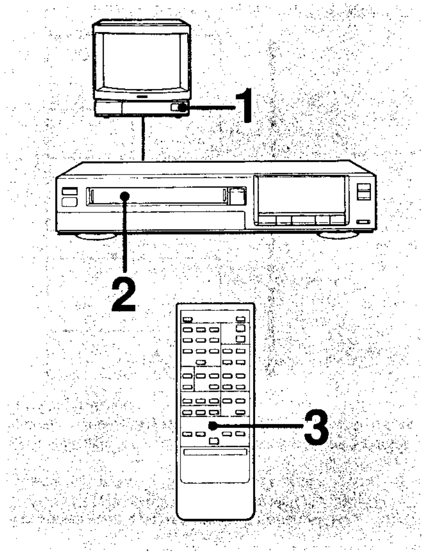
In the SP mode, the tape runs three times as fast as in the EP mode, and twice as fast as in the LP mode.

When the PAL format cassette is used for the NTSC system recording, the actual recording time is shorter than the standard recording time stipulated on the cassette.

Operation

Playback

Playing back a Tape



1 **Turn on the TV and select the program position for the VTR or select the input for the VTR.**

2 **Insert a cassette.**
The power is turned on automatically, and the ꝏ indicator appears in the display window.
If you insert a cassette whose safety tab is broken off, playback will start automatically.

3 **Press ► PLAY.**
Playback begins.

Stopping playback
Press ■ STOP.

To start playing back automatically after the tape is rewound to its beginning (auto play)
Press AUTO PLAY on the Commander or ► PLAY while pressing ◄◄ REW on the VTR.

To eject the cassette automatically after the tape is rewound
Press ≜ EJECT while pressing ◄◄ REW on the VTR. The cassette is ejected when the tape is rewound to the beginning of the tape or to the counter memory (0H00M00S) position (See page 22).

Playback

When the tape is played back to the end
The tape is automatically rewound to the beginning (auto rewind).
The power remains on.
If a cassette with the safety tab removed is used, the cassette will be automatically ejected after it has been rewound to the beginning.

To advance the tape rapidly
Press ►► FF.
If the tape reaches its end, it will be automatically rewound to the beginning.

To rewind the tape
Press ◄◄ REW.

If a cassette has been inserted
Press ► PLAY, ►► FF or ◄◄ REW on the VTR. The power will be turned on automatically, and the tape runs in accordance with the pressed button.

Note
Sufficient picture quality may not be obtained when playing back tapes recorded on another VTR, or tapes with unsatisfactory recording.

Direct Power-on System
The power is turned on automatically by pressing the following buttons on the VTR or Remote Commander.

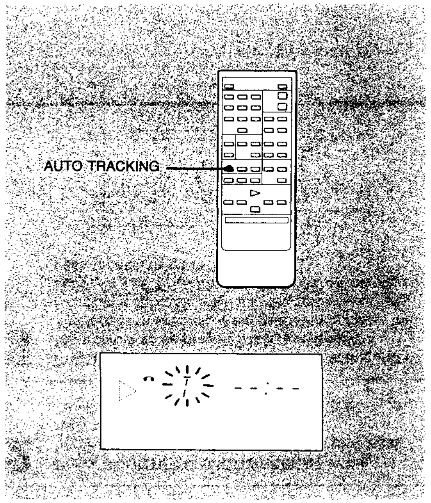
On the VTR
When a cassette tape is installed
PROGRAM +/–, TUNER PRESET, ◄◄ REW, ► PLAY, ►► FF

When a cassette tape is not installed
PROGRAM +/–, TUNER PRESET

On the Remote Commander
When a cassette tape is installed
AUTO PLAY, CLOCK SET, TIMER SET, INPUT SELECT and 1 to 9 of the number buttons

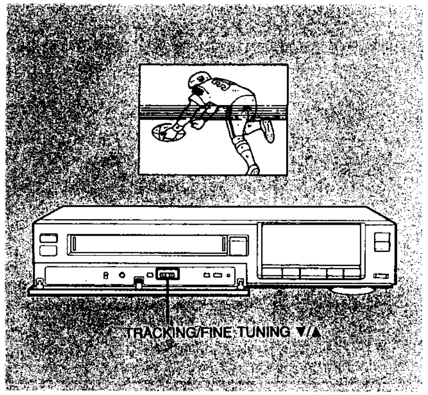
If Streaks or Noise Bands Appear

Automatic adjustment



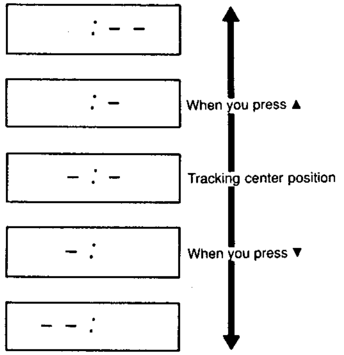
Press AUTO TRACKING during playback.
The DIGITAL AUTO TRACKING indicator lights.

Manual adjustment



If the noise level is not reduced even when AUTO TRACKING is pressed, adjust the tracking manually by pressing TRACKING/FINE TUNING ▼ or ▲.

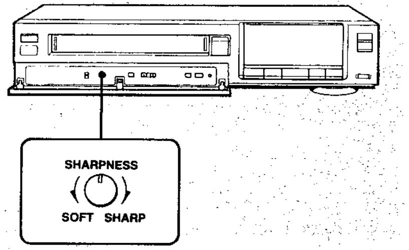
While adjusting the tracking, the tracking position indicator appears in the display window. The tracking position will be indicated as follows:



About three seconds after the button is pressed, the counter display will reappear.

When a prerecorded tape with the copyguard system is played back
The intermittent distortion may appear in the upper portion of the picture. However it is not failure of this unit.

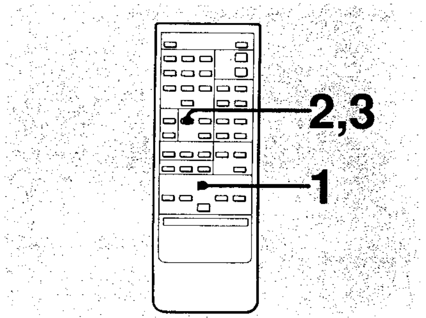
To Adjust the Sharpness of the Picture



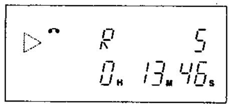
SHARP: To get a sharp picture
SOFT: To get a soft picture

Repeat Play

Using the Remote Commander, you can repeat playback of any desired position on a tape.



1. **Play back the tape.**
2. **Press COUNTER MEMORY/REPEAT at the beginning of the portion you want to play back repeatedly.**
   The R indicator blinks in the display window.
3. **Press COUNTER MEMORY/REPEAT at the end of the portion to be played back repeatedly.**
   The tape is rewound to the repeat start position, the R indicator lights steadily, and the portion you have set by COUNTER MEMORY/REPEAT will be played back repeatedly up to 5 times.



During Repeat Play
The playback pause and frame advance functions are available. However, while the tape is being rewound, these function cannot be activated.

Stopping repeat play
Press ■ STOP or ▶ PLAY.
The repeat portion setting is cancelled.

Notes
- Do not repeat play of the same portion more than 5 times to avoid tape damage.
- To repeat play of another portion, stop the tape, start playback again, and use COUNTER MEMORY/REPEAT at the desired portion.

Various Playback Modes

Locked Picture Search

You can watch the picture while fast-forwarding or rewinding the tape.

During normal playback
Press ▶▶ FF or ◀◀ REW on the VTR, or ⊖/⊕ SEARCH on the Remote Commander.
To resume normal playback, press ▶ PLAY.

Picture Search

You can watch the picture at high speed as long as the specific button on the Remote Commander is kept pressed.

During normal playback or still picture
Press and hold ▶▶ FF or ◀◀ REW.
When you release the button, normal playback or still picture will resume.

During fast-forwarding the tape
Press and hold ▶▶ FF.
When you release the button, the tape will be fast-forwarded again.

During rewinding the tape
Press and hold ◀◀ REW.
When you release the button, the tape will be rewound again.

Still Picture

Press II/▶◀ PAUSE/STILL on the VTR or II PAUSE on the Remote Commander during normal playback or one of the various playback modes.
To release the still picture, press ▶ PLAY or II PAUSE on the Remote Commander or ▶ PLAY on the VTR.

Notes
- If the still picture mode lasts for more than approximately 5 minutes, the VTR enters the playback mode automatically.
- When II/▶◀ PAUSE/STILL on the VTR is pressed in the double speed playback mode, the still picture cannot be viewed.

Various Playback Modes

Frame-by-Frame Picture

Press II/▶◀ PAUSE/STILL on the VTR during playback. Each time the button is pressed, the picture advances by one frame. To release the frame advance mode, press ▶ PLAY on the VTR or Remote Commander, or II PAUSE on the Commander.

Double Speed Playback

Press ×2 on the Remote Commander during playback.
To resume normal playback, press ▶ PLAY.

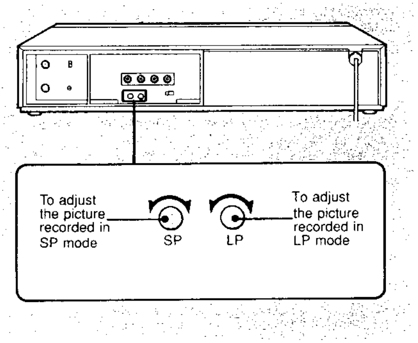
Slow Motion Picture

Press I▶ SLOW +/– on the Remote Commander during playback or in still picture mode.
The + and – buttons determine how slow the tape runs (from 1/5th to 1/25th in PAL and MESECAM systems or 1/30th in NTSC system of the normal playback speed). The tape speed will change each time the button is pressed.
When you keep I▶ SLOW +/– pressed, the slow motion picture advances continuously.
To resume normal playback, press ▶ PLAY.

Note
If the slow motion picture mode lasts for more than approximately 5 minutes, the VTR enters the playback mode automatically.

To View the Stable Picture

If the picture in PAL or MESECAM system shakes during the still, slow or double speed playback mode, while using the SP or LP tape speed, adjust the picture with STILL V-LOCK.


To adjust the picture recorded in SP mode
SP
LP
To adjust the picture recorded in LP mode

About the playback picture in NTSC system
The picture quality of the still, frame-by-frame, slow motion and double speed playback pictures cannot be guaranteed with this unit, when the tape that is recorded on another VTR is used.

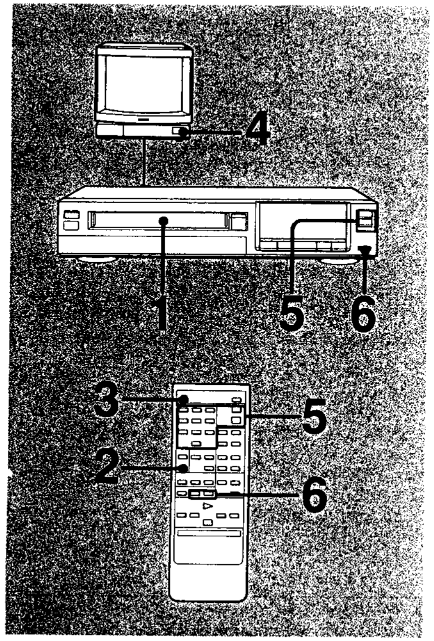
Note on the tape recorded in the LP mode
A tape recorded in the LP mode may not provide picture of sufficient quality during still picture and picture search modes.

During the pause and picture search modes
Noise bands appear. This is normal and is not a problem.

Recording TV Programs

Make sure that you have finished all the connections and adjustments on pages 7 to 13.

Recording



When the tape reaches its end
The tape is automatically rewound to the beginning (auto rewind).
The power remains on.

If the safety tab on the cassette has been broken off
The cassette will be ejected automatically when ● REC is pressed.

When you start recording
If the current time is set, the OFF indicator blinks in the display window. But the indicator goes off after about 10 seconds. The blinking OFF indicator shows that you can set the record end time using the quick start recording function.

1 **Insert a cassette.**
The power is turned on automatically and the ꝏ indicator appears.

2 **Press INPUT SELECT, if the AU indicator lights in the display window.**

3 **Select the recording speed.**

4 **Turn on the TV and select the program position for the VTR or select the input for the VTR.**

5 **Select the program position to be recorded.**

6 **Press ● REC on the VTR, or press ● REC on the Remote Commander while pressing the recording auxiliary button.**
Recording will begin.

When you want to record a program without watching the TV
Turn off the power of the TV or color monitor.

To stop the tape momentarily during recording
Press II/▶◀ PAUSE/STILL on the VTR or II PAUSE on the Remote Commander.
To resume recording, press II PAUSE on the Commander or ● REC on the VTR again.

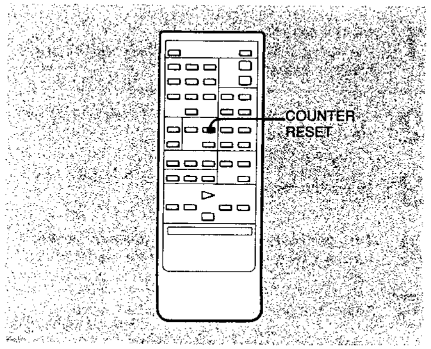
To View One TV Program While Recording Another

Simply select the program you want to view on the TV.
If you do not connect a TV tuner together with the monitor, you cannot watch a TV program while recording another program.

Use of the Tape Counter

The tape counter indicates the approximate running time of the tape and the relative position of programs on the tape.

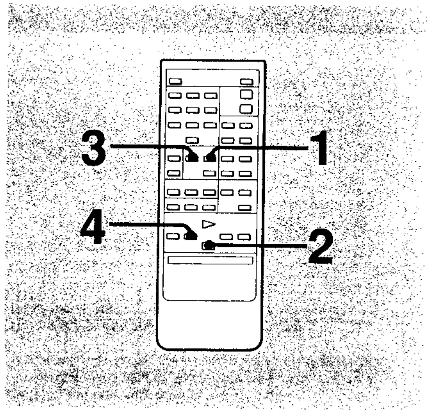
Indexing the Tape Contents



Before starting recording or playback, press COUNTER RESET on the Remote Commander to set the counter to "0H00M00S." By noting the counter reading at the desired point, you can easily find that point later by referring to the counter. Use the label on the cassette to list the programs and their counter readings.

Notes
- The counter reading is automatically reset to zero when a cassette is newly inserted.
- The counter reading will be retained in the memory even after the power is turned off, as long as the cassette is in the cassette compartment.
- The counter will not advance during any portion of a tape that is unrecorded. So the counter can be used to find unrecorded section on a tape.

Locating the "0H00M00S" Position

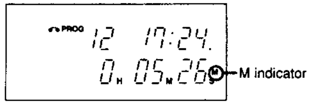


The VTR can memorize the tape position when the counter shows "0H00M00S."
Once the position is memorized, the VTR stops automatically at that position after fast-forwarding or rewinding. Thus you can locate a particular point quickly.

1 **During playback or recording, press COUNTER RESET at the point you want to locate later.**
The counter will indicate "0H00M00S."

2 **When recording or playback is finished, press ■ STOP.**

3 **Press COUNTER MEMORY/REPEAT so that the M indicator appears.**



4 **Press ◀◀ REW to rewind the tape.**
The tape stops automatically at the position right before the "0H00M00S" point.

You can rewind the tape further by pressing ◀◀ REW again. The tape counter shows a negative value with a (–) sign.
In this case, the "0H00M00S" position can be located by pressing ▶▶ FF.

Auto play
The tape is rewound to the "0H00M00S" position by pressing AUTO PLAY on the Commander or ▶ PLAY while pressing ◀◀ REW on the VTR and playback starts automatically.

To cancel the memory

Press COUNTER MEMORY/REPEAT on the Remote Commander.

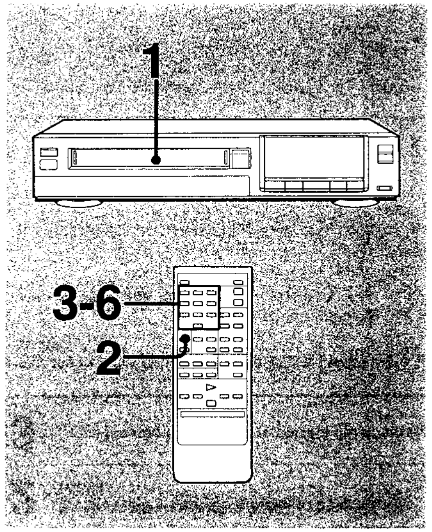
Notes
- The counter will not advance during any portion of a tape that is unrecorded.
- When COUNTER MEMORY/REPEAT is pressed during playback, the VTR will enter in the auto repeat mode.

Timer-Activated Recording

You can preset up to eight recordings as much as one year in advance.

Check before setting the timer
- The date and clock must be set correctly. (See page 8.)
- Make sure that the cassette tape is long enough to record all the programs.
- Be sure that the safety tab of the cassette has not been broken off.
- Set the recording tape speed (SP or LP for PAL system or SP or EP for NTSC system) by pressing the REC MODE button on the VTR or Remote Commander.

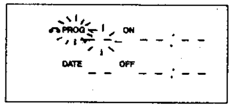
Recording



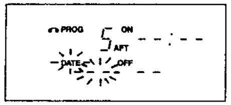
Example: To set program position 5 from 9:30 PM to 11:15 PM on October 24, 1991

1 **Insert a cassette.**

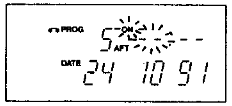
2 **Press TIMER SET.**



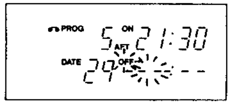
3 **Set the program position.**
When one digit number is set, press "0" first, and then the desired number.



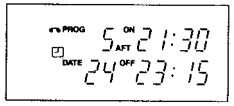
4 **Set the day and month.**



5 **Set the on-time.**



6 **Set the off-time with the number button.**
The VTR enters the timer recording mode, and the ⊡ indicator will appear.

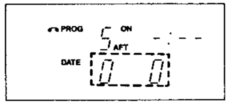


The unit will automatically turn on when the preset time comes and will start recording. When it completes recording, the power will automatically be turned off.

Note
When the month is set in the above step 4, the year will be displayed automatically.

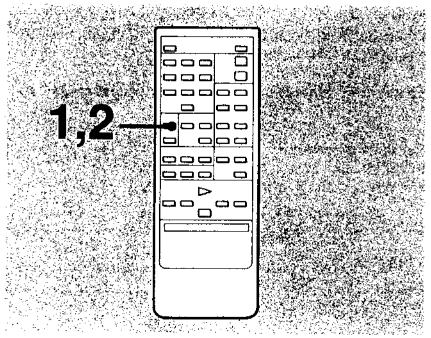
To set other timer recording settings, repeat steps 2 to 6.

For daily recording
Press "0" twice in step 4.
The day and month display becomes "00".



Timer-Activated Recording

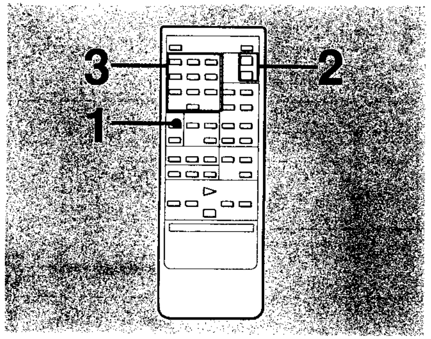
Checking the Preset Time



1 **Press TIMER SET.**
The VTR enters the timer setting mode.

2 **Press TIMER SET.**
Each TIMER SET is pressed, the preset timer settings will be displayed successively.
To confirm month and year, press the PROG. + button twice during confirmation.
When the TIMER SET is pressed at the last preset program, the check mode will be released.

Changing the Timer Settings



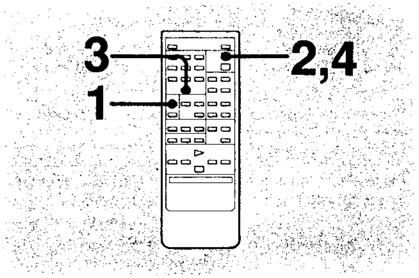
1 **Press TIMER SET until the program to be changed is displayed.**

2 **Press PROG + until the number to be changed blinks.**

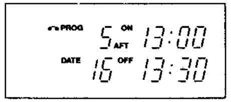
3 **Press the number buttons to correct the number.**

Press the PROG + button to skip the displays which are not changed.

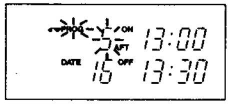
Cancelling the Timer Setting



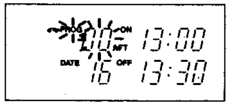
1


PROG
5
ON
AFT
13:00
DATE
15
OFF
13:30

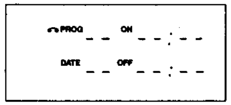
2


PROG
5
ON
AFT
13:00
DATE
15
OFF
13:30

3


PROG
00
ON
AFT
13:00
DATE
15
OFF
13:30

4


PROG
ON
--:--
DATE
OFF
--:--

1 **Press TIMER SET until the program to be cancelled is displayed.**

2 **Press PROG +.**

3 **Press "0" number button twice to set the program position to "00".**

4 **Press PROG +.**

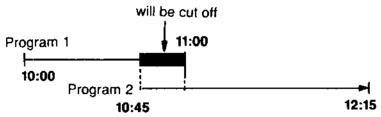
Timer-Activated Recording

Note on the timer-activated recording

If the tape reaches its end before the preset end time, the VTR will stop and will be turned off automatically.

When the presettings of your timer-activated recordings overlap

The recording of program 2 will start at the preset time and the recording of program 1 will be cut off.


will be cut off
Program 1
11:00
10:00
Program 2
10:45
12:15

Notes
- If a power interruption of 1 hour or more occurs while the VTR is waiting for the preset time, the memory will be cleared. Reset the clock and preset the data for timer-activated recordings again.
- If a power interruption of less than 1 hour occurs during a timer recording, the VTR will start recording again when power is fed, and the tape counter will indicate "0H00M00S."
- If a power interruption of more than 1 hour occurs during a timer recording, recording will stop.

Problems on Timer-Activated Recording

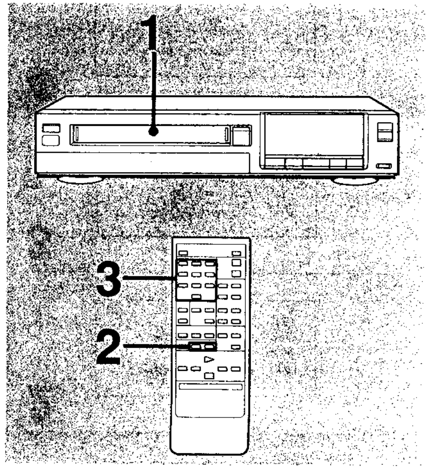
Symptom	Possible cause
After completing the setting, the ⊡ indicator blinks.	No cassette is inserted. Insert the cassette and turn off the VTR.
The cassette is ejected when the VTR is turned off after setting the timer.	The safety tab is broken off.
The desired program cannot be recorded.	COLOR SYSTEM SELECT is not set to the color system for the program to be recorded.

Quick Start Recording

The quick start recording function provides a simplified timer-activated recording procedure.
Using this function, you can start recording a TV program immediately and leave the VTR right away.

The recording end time can be set for up to 24 hours by 30-minute or 1 minute interval.

Start Recording

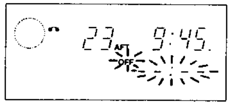


If you do not press ● REC during the OFF indication blinks
The OFF indicator goes off, and the recording continues to the end of the tape unless you stop recording.

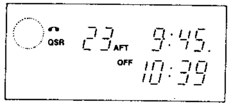
When the tape reaches its end
Recording stops, but the tape will not be rewound to the beginning. Power is turned off automatically.

1 **Insert a cassette.**

2 **Start recording.**
The OFF indicator blinks in the display window.



3 **Set the recording end time with the number buttons within 10 seconds.**
For one digit number, first press the 0 button.



You can leave the VTR, and the recording stops when the preset recording duration has elapsed.

You can also set the recording end time with the ● REC or PROG.+/– button as follows.

- **● REC button** (When the Commander is used, ● REC and auxiliary buttons): the time will increase by 30 minutes.
- **PROGRAM + button:** the timer will increase by 1 minute
- **PROGRAM – button:** the time will decrease by 1 minute

Example:

9:45
↓
10:00→10:30→10:31
└10:32 ...→10:39

To stop the recording
Press the ■ STOP button.

Index Function

A desired program can be easily located by an index signal marked on the tape.

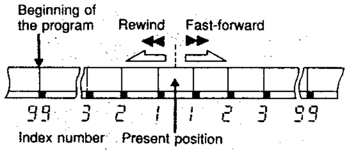
How Index Signals are Marked

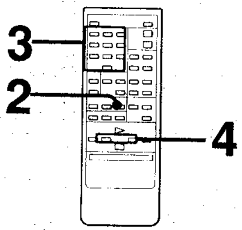
An index signal is automatically marked on the tape when a recording starts.
The "Id" indicator blinks in the display window while an index signal is being marked.

Note
The index signal is marked only when you start recording from the stop mode.
If the VTR is set to the recording-pause mode and then recording is resumed, no index signal will be marked.

Locating a Desired Program — Index Search

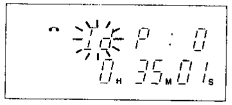
You can locate a desired program and play it back automatically by designating its index position.
Up to the 99th index signal from the present position on the tape can be located.



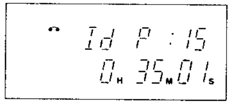


1 **Insert a recorded cassette.**

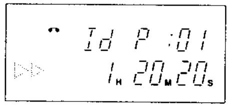
2 **Press INDEX/GO TO during stop or playback mode.**
The index indicator appears.



3 **Designate the index number of the program you want to locate.**
The index number will be displayed in the display window.

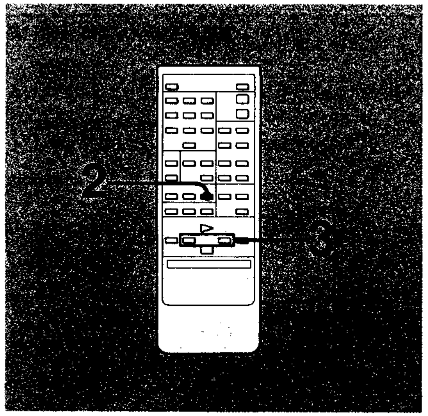


4 **To locate a previous program on the tape, press ◀◀ REW.**
To locate a program ahead, press ▶▶ FF.
The tape will be rewound or advanced rapidly and played back automatically. Every time an index signal is detected, the index number will decrease.



To release the index mode
Press INDEX/GO TO on the Commander **twice**.

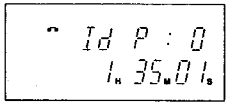
Watching the Beginning of Each Recording Consecutively—Index Scan



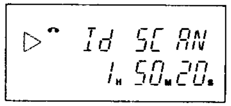
You can watch the beginning of each recording consecutively by detecting the index signal one by one.

1 **Insert a recorded cassette.**

2 **Press INDEX/GO TO during stop or playback mode.**
The index indicator appears.



3 **Press ►► FF or ◄◄ REW.**



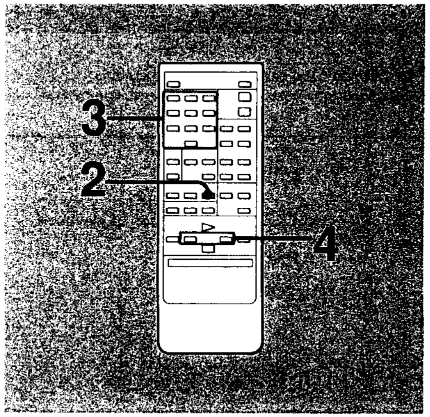
The tape will be fast-forwarded or rewound, and the VTR will search for an index signal.
While the VTR is searching for the first index signal, "Id SCAN" will be displayed on the display window.
Each time an index signal is detected, the VTR enters the playback mode, and a portion of 5 seconds will be played back. Then the VTR will resume searching for the next index signal.

To view the normal playback picture
Press ► **PLAY** during the index playback for 5 seconds.

To stop index scan
Press ■ **STOP**.

To release the index mode
Press INDEX/GO TO on the Commander **twice**.

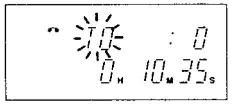
Time Search Function



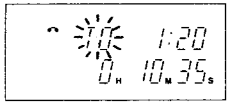
You can quickly advance or rewind the tape to any point measured in actual playback time and play back the tape automatically from the point.

1 **Insert a recorded cassette.**

2 **Press INDEX/GO TO twice during stop or playback mode.**
The TO indicator appears and the counter indicator changes to "0".



3 **Designate the time for which you want to advance or rewind the tape.**



4 **To advance the tape, press ►► FF.**
To rewind the tape, press ◄◄ REW.
After the tape is advanced or rewound for the setting time, the playback starts automatically.

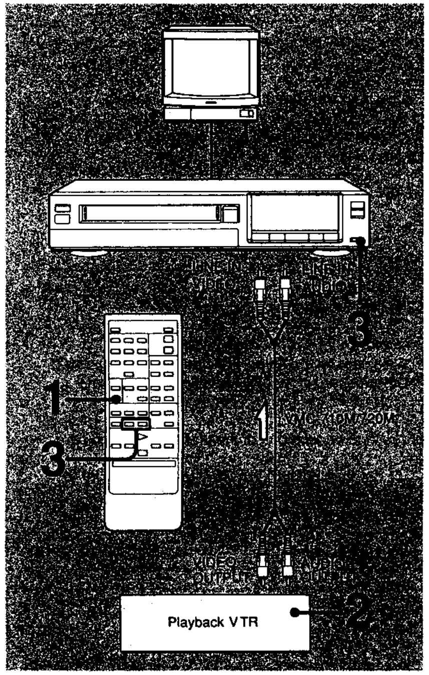
Note
The error between the designated time and the counter reading is about ±30 seconds.

Editing

Tape Editing

To edit a home movie tape, you need video cassette recorders.

Editing Home Movie Tapes from Another


LINE IN VIDEO
LINE IN AUDIO
3
1
3
VMC-710M/720M
VIDEO OUTPUT
AUDIO OUTPUT
Playback VTR
2

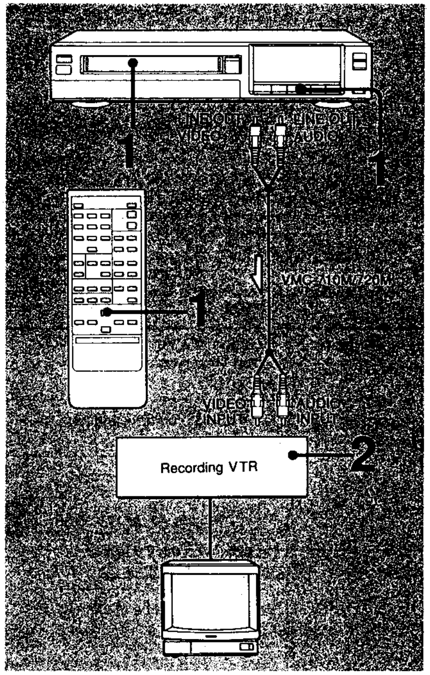
Operation

1 Press INPUT SELECT so that the AU indicator lights in the display window.

2 Insert a recorded cassette into the other VTR and start playback.

3 Start recording with this VTR.

Editing Home Movie Tape onto Another VTR


LINE OUT VIDEO
LINE OUT AUDIO
1
1
VMC-710M/720M
1
VIDEO INPUT
AUDIO INPUT
Recording VTR
2

Operation

1 Insert recorded cassette into this VTR and start playback.

2 Set the input select switch to LINE and start recording with the other VTR.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF UPPER CASE

It is widen on both sides the back of upper case and remove up direction.

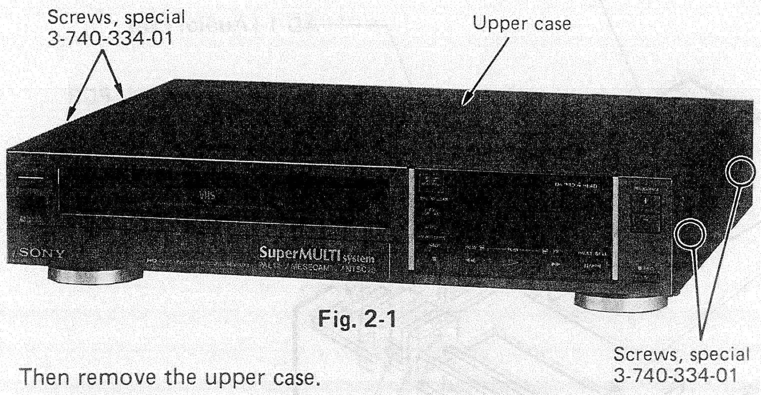

Screws, special
3-740-334-01
Upper case
Screws, special
3-740-334-01

Fig. 2-1

Then remove the upper case.

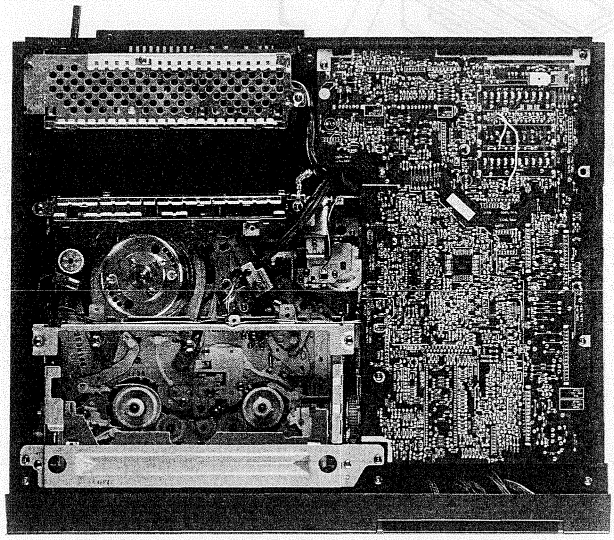


Fig. 2-2

2-2. REMOVAL OF BOTTOM PLATE

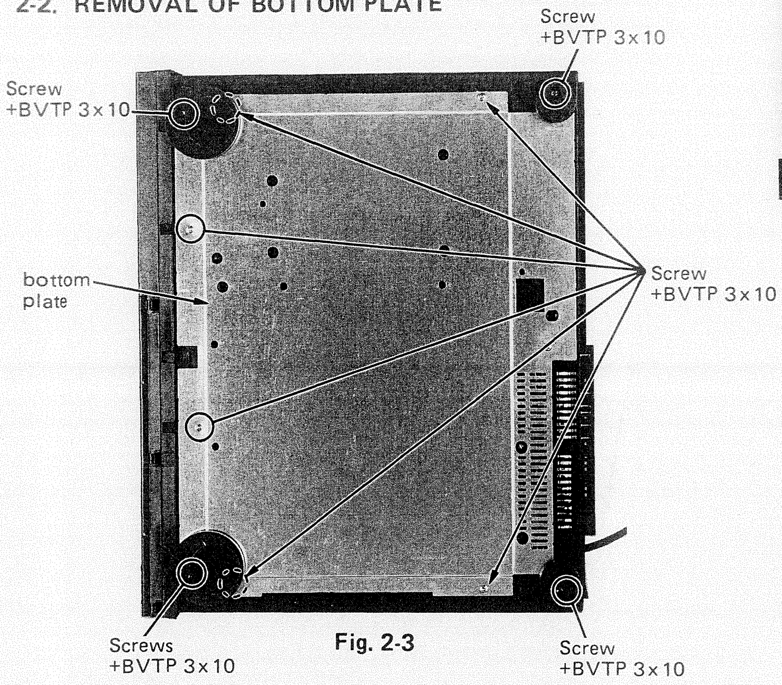

Screw
+BVTP 3x10
Screw
+BVTP 3x10
bottom plate
Screw
+BVTP 3x10
Screws
+BVTP 3x10
Screw
+BVTP 3x10

Fig. 2-3

Then remove the bottom plate.

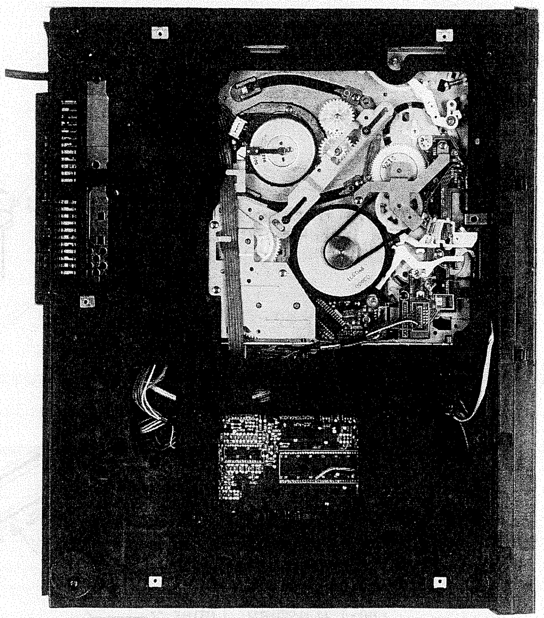


Fig. 2-4

2-3. REMOVAL OF FRONT CABINET

Then remove the upper case, and screws (+BVTP 3x10), bottom plate and raise up the claws (three places) front cabinet as shown by Fig. 2-5, and remove front cabinet in the arrow direction.

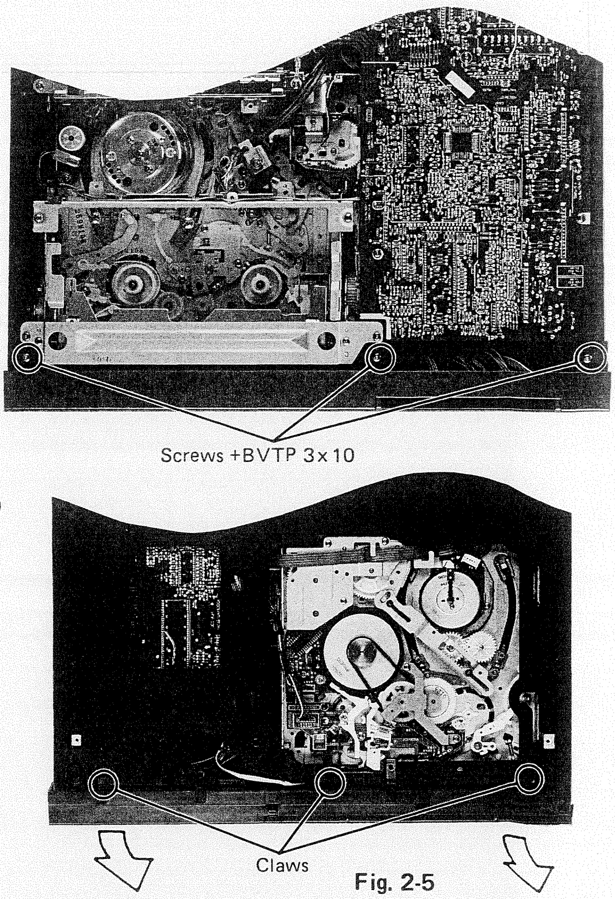
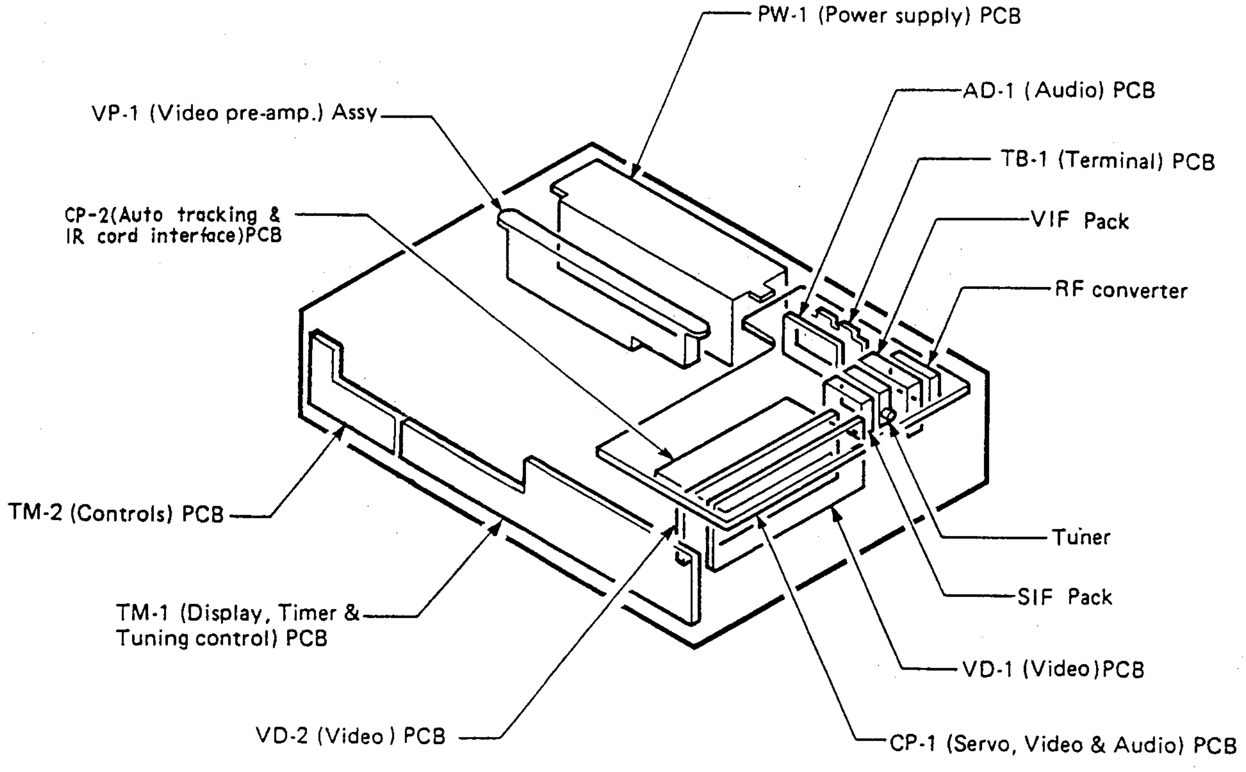

Screws +BVTP 3x10
Claws

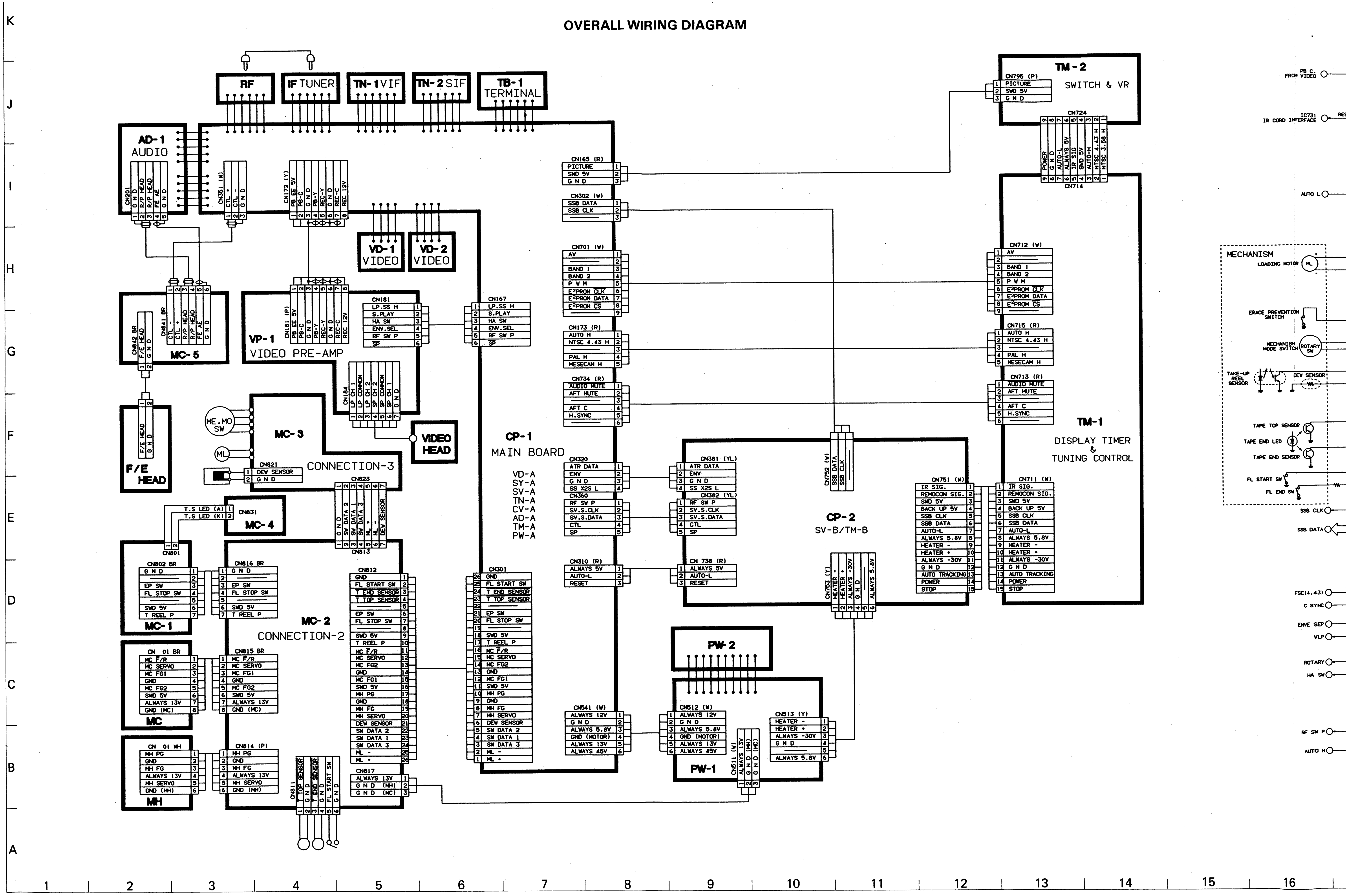
Fig. 2-5

SECTION 3
DIAGRAMS

CIRCUIT BOARD LOCATIONS

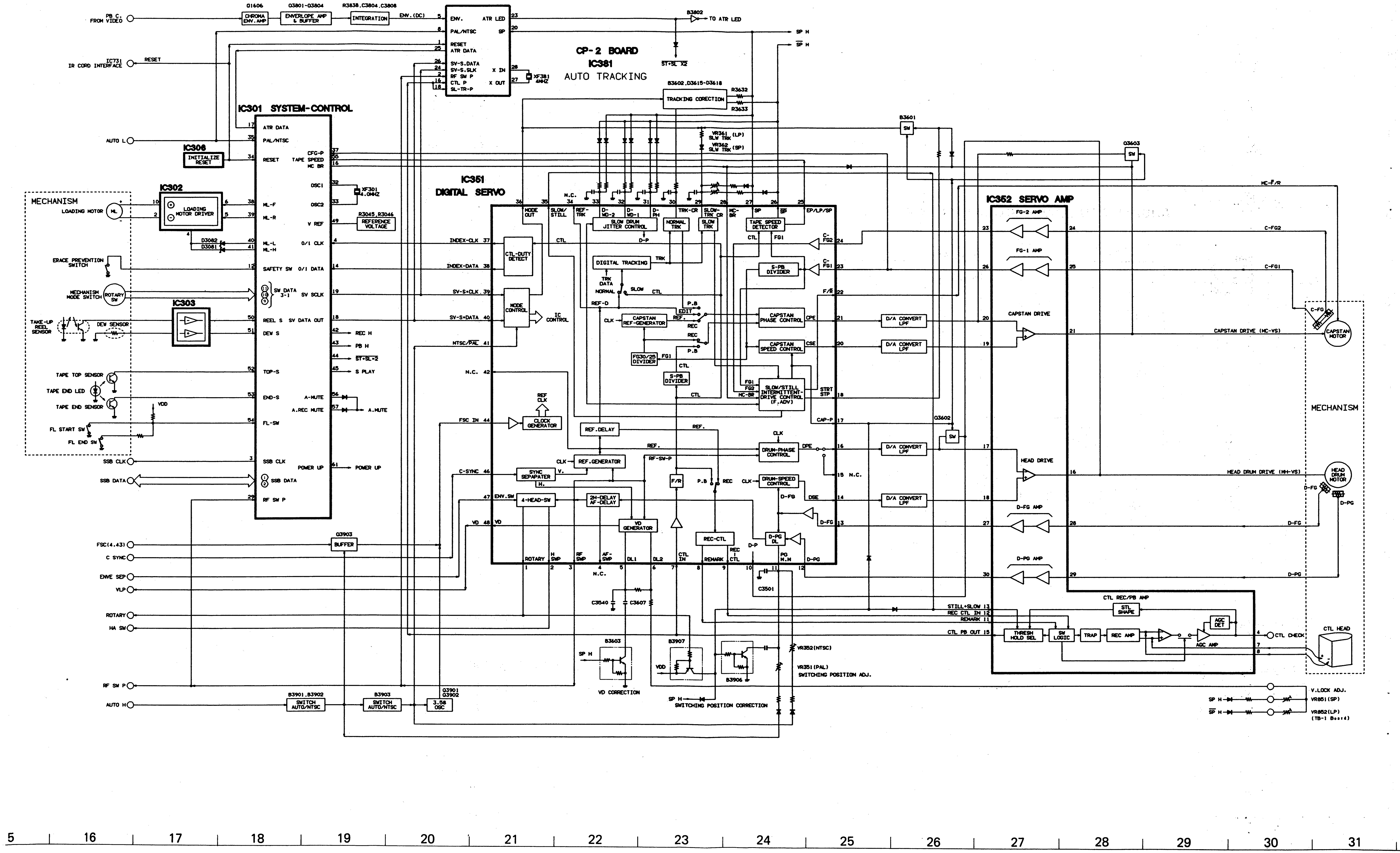

PW-1 (Power supply) PCB
AD-1 (Audio) PCB
VP-1 (Video pre-amp.) Assy
TB-1 (Terminal) PCB
CP-2(Auto tracking & IR cord interface)PCB
VIF Pack
RF converter
TM-2 (Controls) PCB
Tuner
SIF Pack
TM-1 (Display, Timer & Tuning control) PCB
VD-1 (Video)PCB
VD-2 (Video) PCB
CP-1 (Servo, Video & Audio) PCB

OVERALL WIRING DIAGRAM

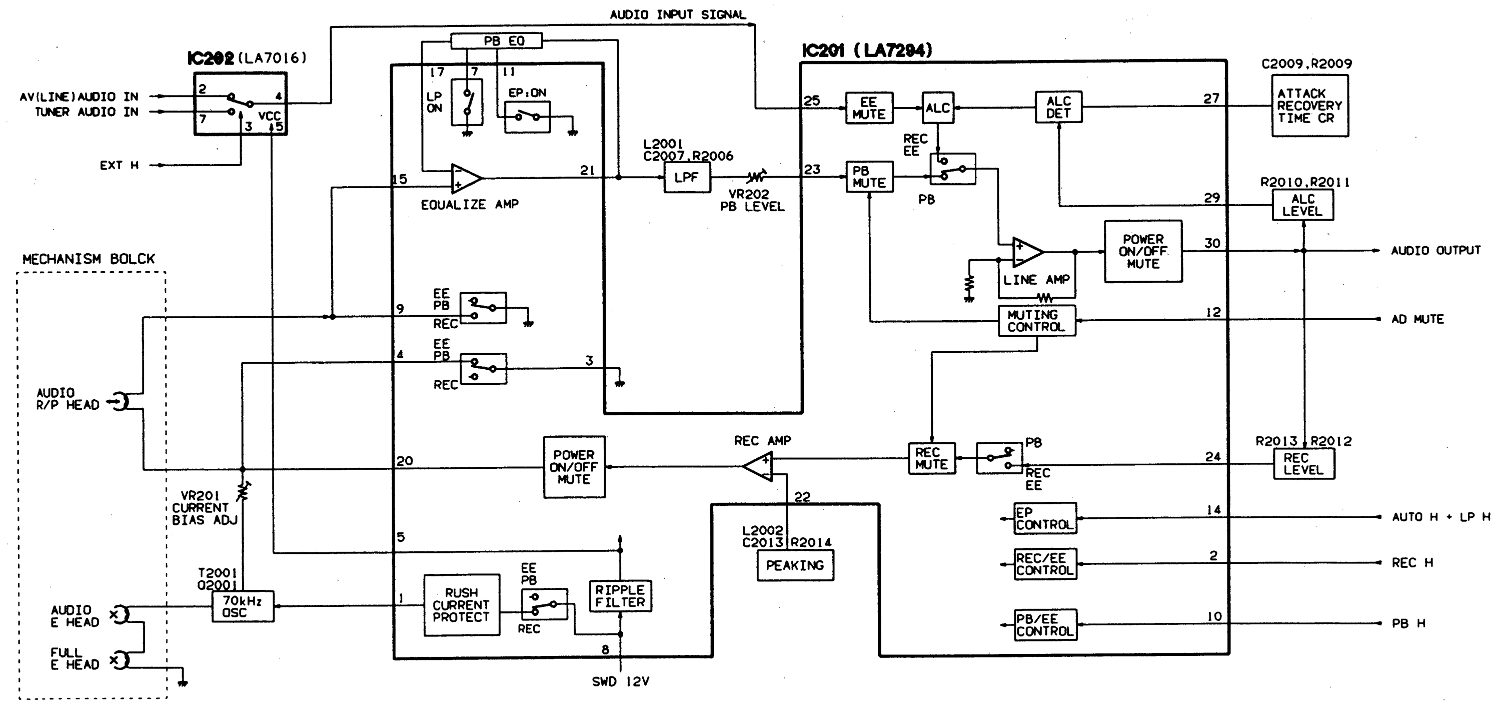


RF
IF TUNER
TN-1 VIF
TN-2 SIF
TB-1 TERMINAL
AD-1 AUDIO
CN201
GND
R/P HEAD
R/P HEAD
FE AE
GND
CN351 (W)
CTL +
CTL -
GND
CN172 (Y)
PB EE 5V
PB-C
GND
PB-Y
REC-Y
GND
REC-C
REC 12V
VD-1 VIDEO
VD-2 VIDEO
MC-5
CN841 BR
CN842 BR
F/E HEAD
VP-1 VIDEO PRE-AMP
CN181 (P)
CN181
LP.SS H
S.PLAY
HA SW
ENV.SEL
RF SW P
SP
CN184
LP CH 1
LP COMMON
LP CH 2
SP CH 2
SP COMMON
SP CH 1
GND
CN167
F/E HEAD
ME.MO SW
ML
MC-3
CONNECTION-3
CN821
DEW SENSOR
GND
CN823
CN813
SW DATA 2
SW DATA 3
SW DATA 1
ML +
ML -
DEW SENSOR
VIDEO HEAD
MC-4
CN831
T.S LED (A)
T.S LED (K)
CN801
MC-1
CN802 BR
CN816 BR
EP SW
FL STOP SW
SWD 5V
T REEL P
MC-2
CONNECTION-2
CN812
FL START SW
T END SENSOR
T TOP SENSOR
MC
CN 01 BR
CN815 BR
MC F/R
MC SERVO
MC FG1
MC FG2
ALWAYS 13V
GND (MC)
MH
CN 01 WH
CN814 (P)
MH PG
MH FG
MH SERVO
GND (MH)
CN811
CN817
CN301
CP-1
MAIN BOARD
VD-A
SY-A
SV-A
TN-A
CV-A
AD-A
TM-A
PW-A
CN165 (R)
PICTURE
SWD 5V
CN302 (W)
SSB DATA
SSB CLK
CN701 (W)
AV
BAND 1
BAND 2
PWM
E²PROM CLK
E²PROM DATA
E²PROM CS
CN173 (R)
AUTO H
NTSC 4.43 H
PAL H
MESECAM H
CN734 (R)
AUDIO MUTE
AFT MUTE
AFT C
H.SYNC
CN320
ATR DATA
ENV
SS X2S L
CN360
SV.S.CLK
SV.S.DATA
CTL
CN310 (R)
ALWAYS 5V
AUTO-L
RESET
CN541 (W)
ALWAYS 12V
ALWAYS 5.8V
GND (MOTOR)
ALWAYS 45V
PW-2
PW-1
CN512 (W)
CN511 (W)
CN513 (Y)
HEATER -
HEATER +
ALWAYS -30V
CP-2
SV-B/TM-B
CN381 (YL)
CN382 (YL)
CN 738 (R)
CN752 (W)
CN753 (Y)
CN751 (W)
IR SIG.
REMOCON SIG.
BACK UP 5V
AUTO TRACKING
POWER
STOP
TM-2
SWITCH & VR
CN795 (P)
CN724
CN714
AUTO-H
NTSC 3.58 H
TM-1
DISPLAY TIMER & TUNING CONTROL
CN712 (W)
CN715 (R)
CN713 (R)
CN711 (W)
MECHANISM
LOADING MOTOR
ERACE PREVENTION SWITCH
MECHANISM MODE SWITCH
ROTARY SW
TAKE-UP REEL SENSOR
DEW SENSOR
TAPE TOP SENSOR
TAPE END LED
TAPE END SENSOR
FL START SW
FL END SW
PB C. FROM VIDEO
IC731 IR CORD INTERFACE
AUTO L
SSB CLK
SSB DATA
FSC(4.43)
C SYNC
ENVE SEP
VLP
ROTARY
HA SW
RF SW P
AUTO H
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

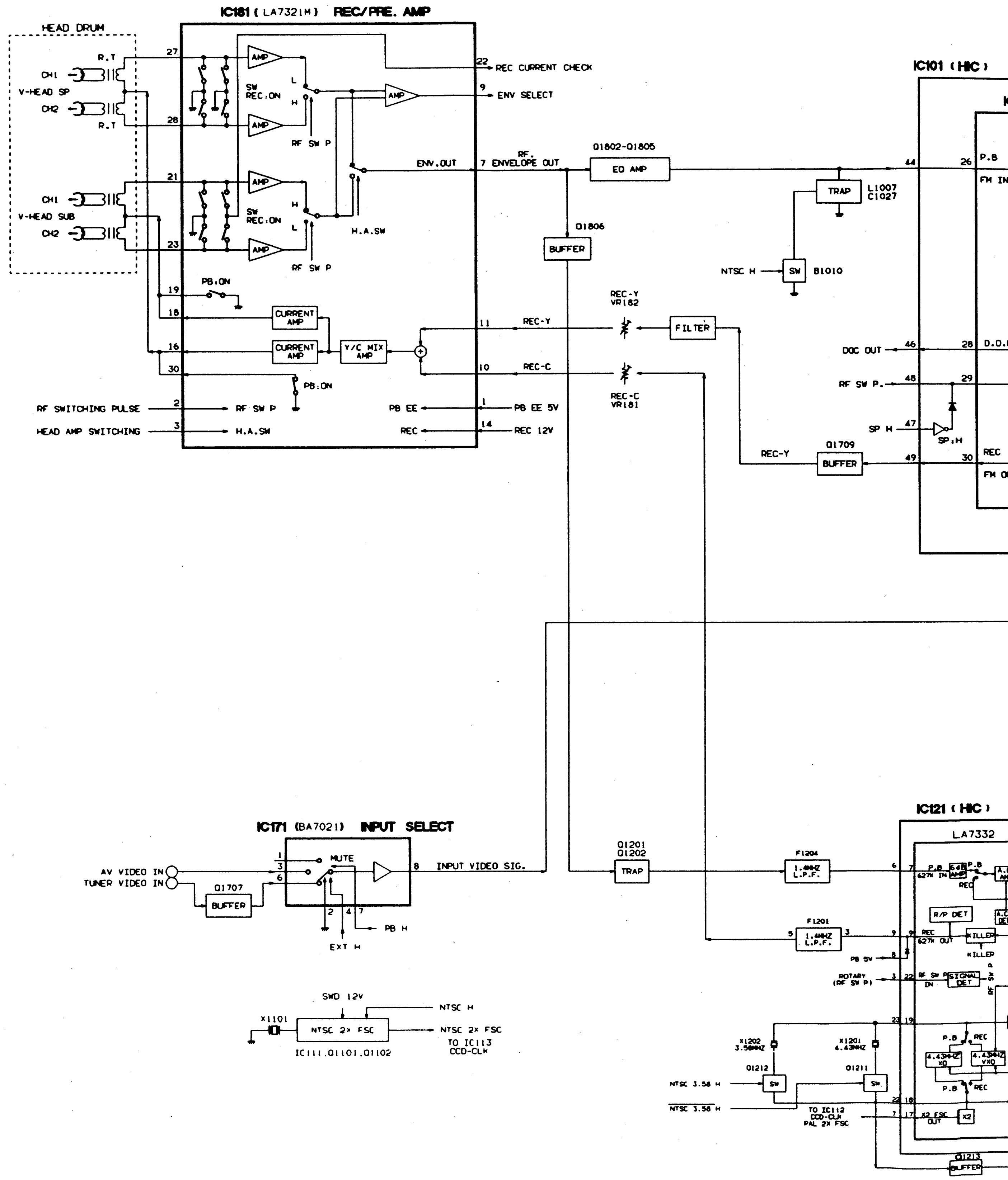
SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM


PB C. FROM VIDEO
Q1606 CHROMA ENV. AMP
Q3801-Q3804 ENVERLOPE AMP & BUFFER
R3838, C3804, C3808 INTEGRATION
ENV. (DC)
ENV.
PAL/NTSC
RESET
ATR DATA
SV-S.DATA
SV-S.SLK
RF SW P
CTL P
SL-TR-P
ATR LED
SP
X IN
X OUT
XF381 4MHZ
CP-2 BOARD
IC381
AUTO TRACKING
B3802 TO ATR LED
ST+SL X2
SP H
SP H
IC731 IR CORD INTERFACE
RESET
IC301 SYSTEM-CONTROL
AUTO L
IC306 INITIALIZE RESET
ATR DATA
PAL/NTSC
RESET
CFG-P
TAPE SPEED
MC BR
OSC1
OSC2
XF301 4.0MHZ
R3045, R3046 REFERENCE VOLTAGE
V REF
MECHANISM
LOADING MOTOR
ML
IC302 LOADING MOTOR DRIVER
ML-F
ML-R
D3082
D3081
ML-L
ML-H
0/1 CLK
ERACE PREVENTION SWITCH
SAFETY SW
0/1 DATA
MECHANISM MODE SWITCH
ROTARY SW
SW DATA 3-1
SV SCLK
IC303
TAKE-UP REEL SENSOR
DEW SENSOR
REEL S
SV DATA OUT
DEW S
REC H
PB H
ST+SL=2
S PLAY
TAPE TOP SENSOR
TOP-S
TAPE END LED
TAPE END SENSOR
END-S
A-MUTE
A.REC MUTE
A.MUTE
VDD
FL START SW
FL END SW
FL-SW
SSB CLK
SSB DATA
POWER UP
POWER UP
RF SW P
FSC(4.43)
Q3903 BUFFER
C SYNC
ENVE SEP
VLP
ROTARY
HA SW
RF SW P
AUTO H
B3901, B3902 SWITCH AUTO/NTSC
B3903 SWITCH AUTO/NTSC
Q3901 Q3902 3.58 OSC
IC351 DIGITAL SERVO
INDEX-CLK
INDEX-DATA
SV-S+CLK
SV-S+DATA
NTSC/PAL
N.C.
FSC IN
C-SYNC
ENV.SW
VD
MODE OUT
SLOW/STILL
REF-TRK
D-WD-2
D-WD-1
D-PH
TRK-CR
SLOW-TRK CR
MC-BR
SP
SP
EP/LP/SP
SLOW DRUM JITTER CONTROL
NORMAL TRK
SLOW TRK
TAPE SPEED DETECTOR
CTL-DUTY DETECT
MODE CONTROL
IC CONTROL
DIGITAL TRACKING
TRK DATA
NORMAL
SLOW
REF-D
EDIT
CAPSTAN REF-GENERATOR
FG30/25 DIVIDER
S-PB DIVIDER
S-PB DIVIDER
CAPSTAN PHASE CONTROL
CAPSTAN SPEED CONTROL
SLOW/STILL INTERMITTENT-DRIVE CONTROL (F.ADV)
STRT STP
CAP-P
REF CLK
CLOCK GENERATOR
REF.DELAY
REF.GENERATOR
SYNC SEPAPATER
H.
4-HEAD-SW
2H-DELAY AF-DELAY
VD GENERATOR
F/R
DRUM-PHASE CONTROL
DRUM-SPEED CONTROL
REC-CTL
D-PG DL
ROTARY SWP
H SWP
RF SWP
AF-SWP
DL1
DL2
CTL IN
REMARK
REC CTL
PG H.M
D-PG
C3501
C3540
C3607
B3603 VD CORRECTION
B3907
B3906
VR352(NTSC)
VR351(PAL) SWITCHING POSITION ADJ.
SP H
SWITCHING POSITION CORRECTION
B3602, D3615-D3618 TRACKING CORECTION
R3632
R3633
VR361 SLW TRK (LP)
VR362 SLW TRK (SP)
B3601 SW
Q3603 SW
Q3602 SW
MC-F/R
D/A CONVERT LPF
D/A CONVERT LPF
D/A CONVERT LPF
D/A CONVERT LPF
IC352 SERVO AMP
FG-2 AMP
FG-1 AMP
CAPSTAN DRIVE
HEAD DRIVE
D-FG AMP
D-PG AMP
C-FG2
C-FG1
C-FG
CAPSTAN DRIVE (MC-VS)
CAPSTAN MOTOR
MECHANISM
HEAD DRUM DRIVE (MH-VS)
HEAD DRUM MOTOR
D-FG
D-PG
CTL REC/PB AMP
STILL+SLOW
REC CTL IN
REMARK
CTL PB OUT
STL SHAPE
THRESH HOLD SEL
SW LOGIC
TRAP
REC AMP
AGC DET
AGC AMP
CTL CHECK
CTL HEAD
V.LOCK ADJ.
VR851(SP)
VR852(LP) (TB-1 Board)
5
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31

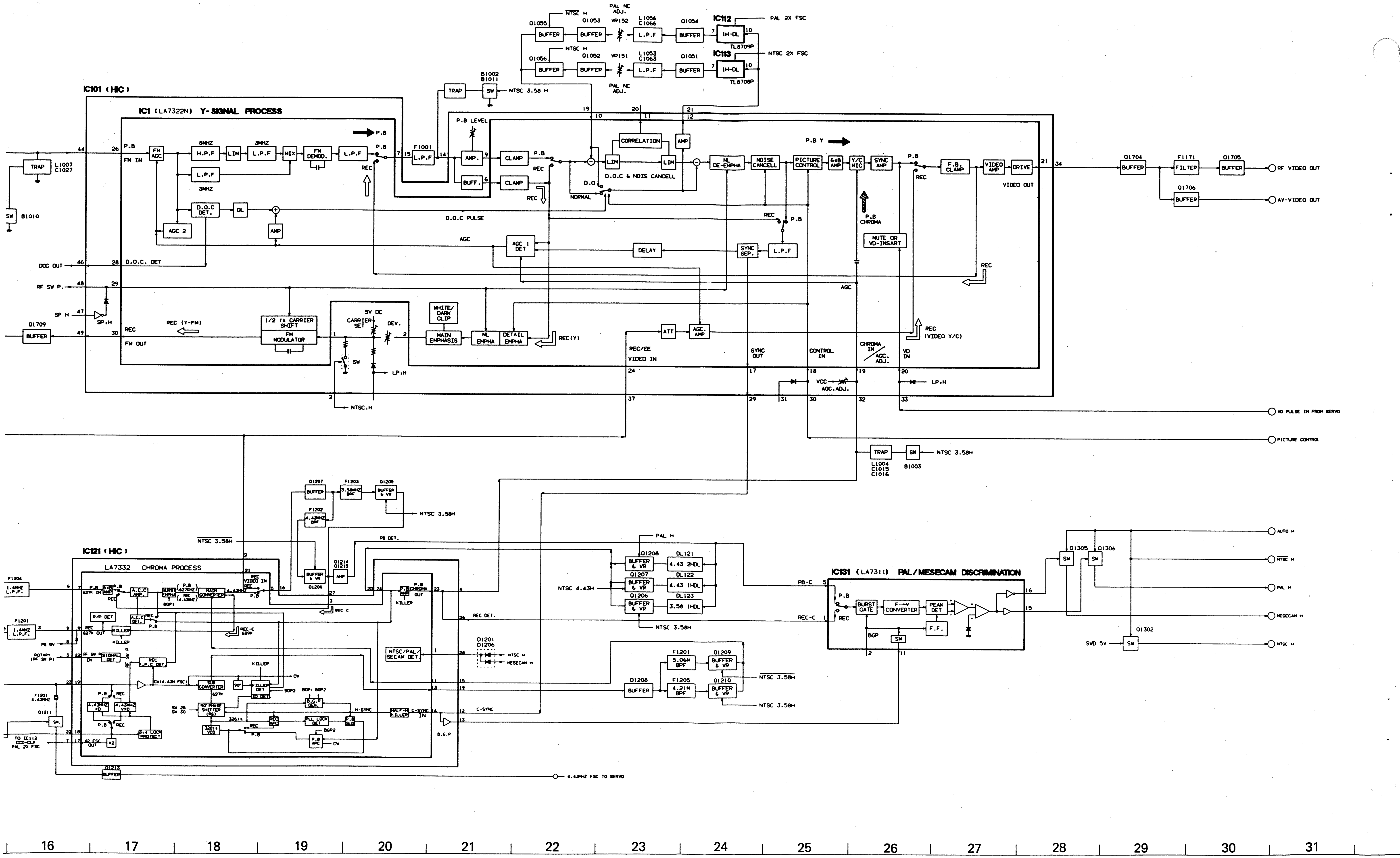
AUDIO CIRCUIT BASIC BLOCK DIAGRAM


AUDIO INPUT SIGNAL
IC202 (LA7016)
AV(LINE)AUDIO IN
TUNER AUDIO IN
VCC
EXT H
PB EQ
LP ON
EP:ON
EQUALIZE AMP
IC201 (LA7294)
EE MUTE
ALC
ALC DET
L2001 C2007,R2006
LPF
VR202 PB LEVEL
PB MUTE
REC EE
PB
LINE AMP
POWER ON/OFF MUTE
MUTING CONTROL
C2009,R2009
ATTACK RECOVERY TIME CR
R2010,R2011
ALC LEVEL
AUDIO OUTPUT
AD MUTE
MECHANISM BOLCK
AUDIO R/P HEAD
EE PB REC
REC AMP
REC MUTE
R2013 R2012
REC LEVEL
VR201 CURRENT BIAS ADJ
L2002 C2013 R2014
PEAKING
EP CONTROL
REC/EE CONTROL
PB/EE CONTROL
AUTO H + LP H
REC H
PB H
T2001 Q2001
70kHz OSC
AUDIO E HEAD
FULL E HEAD
RUSH CURRENT PROTECT
RIPPLE FILTER
SWD 12V

VP-1


IC181 (LA7321M) REC/PRE. AMP
HEAD DRUM
R.T
CH1
V-HEAD SP
CH2
V-HEAD SUB
AMP
SW REC:ON
RF SW P
H.A.SW
REC CURRENT CHECK
ENV SELECT
ENV.OUT
RF. ENVELOPE OUT
Q1802-Q1805
EQ AMP
Q1806
BUFFER
PB:ON
CURRENT AMP
Y/C MIX AMP
REC-Y
REC-C
REC-Y VR182
REC-C VR181
FILTER
RF SWITCHING PULSE
HEAD AMP SWITCHING
PB EE
PB EE 5V
REC
REC 12V
IC101 (HIC)
TRAP
L1007 C1027
NTSC H
SW
B1010
P.B
FM IN
DOC OUT
D.O.
RF SW P.
SP H
SP:H
Q1709
BUFFER
FM O
IC171 (BA7021) INPUT SELECT
AV VIDEO IN
TUNER VIDEO IN
Q1707
BUFFER
MUTE
INPUT VIDEO SIG.
PB H
EXT H
Q1201 Q1202
TRAP
F1204
1.4MHZ L.P.F.
F1201
IC121 (HIC)
LA7332
R/P DET
KILLER
PB 5V
ROTARY (RF SW P)
SIGNAL DET
X1202 3.58MHZ
X1201 4.43MHZ
Q1212
Q1211
NTSC 3.58 H
TO IC112 CCD-CLK PAL 2X FSC
X2 FSC OUT
Q1213 BUFFER
SWD 12V
X1101
NTSC 2X FSC
NTSC H
TO IC113 CCD-CLK
IC111,Q1101,Q1102

VIDEO CIRCUIT BASIC BLOCK DIAGRAM


IC101 (HIC)
IC1 (LA7322N) Y-SIGNAL PROCESS
IC112
IC113
TL8709P
TL8708P
PAL 2X FSC
NTSC 2X FSC
Q1055
Q1053
Q1054
Q1056
Q1052
Q1051
BUFFER
VR152
VR151
L1056 C1066
L1053 C1063
L.P.F
1H-DL
PAL NC ADJ.
NTSC H
B1002 B1011
TRAP
SW
NTSC 3.58 H
P.B LEVEL
F1001
AMP.
BUFF.
CLAMP
CORRELATION
LIM
D.O.C & NOIS CANCELL
NL DE-EMPHA
NOISE CANCELL
PICTURE CONTROL
64B AMP
Y/C MIC
SYNC AMP
F.B. CLAMP
VIDEO AMP
DRIVE
VIDEO OUT
Q1704
F1171
Q1705
Q1706
FILTER
RF VIDEO OUT
AV-VIDEO OUT
FM AGC
8MHZ H.P.F
3MHZ L.P.F
MIX
FM DEMOD.
L1007 C1027
B1010
D.O.C DET.
DL
AGC 2
D.O.C PULSE
AGC 1 DET
DELAY
SYNC SEP.
MUTE OR VD-INSART
P.B CHROMA
DOC OUT
D.O.C. DET
RF SW P.
SP H
SP.H
Q1709
REC (Y-FM)
FM OUT
1/2 fh CARRIER SHIFT
FM MODULATOR
5V DC
CARRIER SET
DEV.
WHITE/DARK CLIP
MAIN EMPHASIS
NL EMPHA
DETAIL EMPHA
REC(Y)
ATT
AGC. AMP
REC (VIDEO Y/C)
REC/EE VIDEO IN
SYNC OUT
CONTROL IN
CHROMA IN / AGC. ADJ.
VD IN
LP.H
NTSC.H
VCC
AGC.ADJ.
VD PULSE IN FROM SERVO
PICTURE CONTROL
L1004 C1015 C1016
B1003
NTSC 3.58H
Q1207
F1203
Q1205
3.58MHZ BPF
BUFFER & VR
F1202
4.43MHZ BPF
PB DET.
IC121 (HIC)
LA7332 CHROMA PROCESS
Q1214 Q1215
Q1206
A.C.C AMP.
MAIN CONVERTER
R/P DET
KILLER
REC A.P.C DET
SUB CONVERTER
90° PHASE SHIFTER
320fh VCO
PLL LOCK DET
P.B APC
B.G.P GEN.
P.B CHROMA AMP
NTSC/PAL/SECAM DET
HALF-H DELAY
C-SYNC IN
B.G.P
X1201 4.43MHZ
Q1211
TO IC112 CCD-CLK PAL 2X FSC
Q1213
4.43MHZ FSC TO SERVO
F1204 1.4MHZ L.P.F
F1201 1.4MHZ L.P.F
PB 5V
ROTARY (RF SW P)
PAL H
Q1208
DL121 4.43 2HDL
Q1207
DL122 4.43 1HDL
Q1206
DL123 3.58 1HDL
NTSC 4.43H
D1201 D1206
NTSC H
MESECAM H
F1201 5.06M BPF
Q1209
F1205 4.21M BPF
Q1210
IC131 (LA7311) PAL/MESECAM DISCRIMINATION
PB-C
REC-C
BURST GATE
F→V CONVERTER
PEAK DET
F.F.
BGP
Q1305
Q1306
Q1302
SWD 5V
AUTO H
NTSC H
PAL H
MESECAM H
16
17
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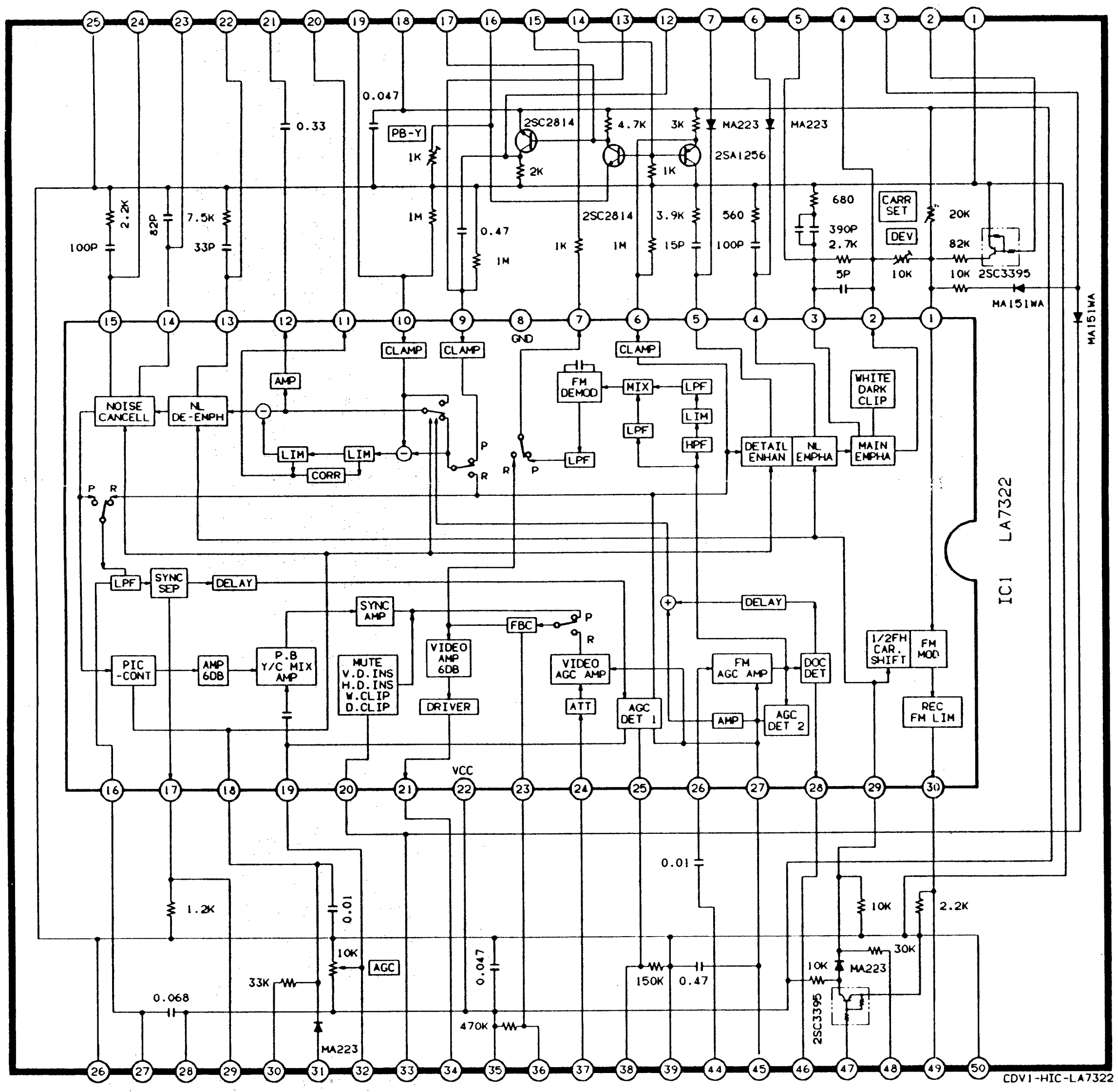
SECTION 4

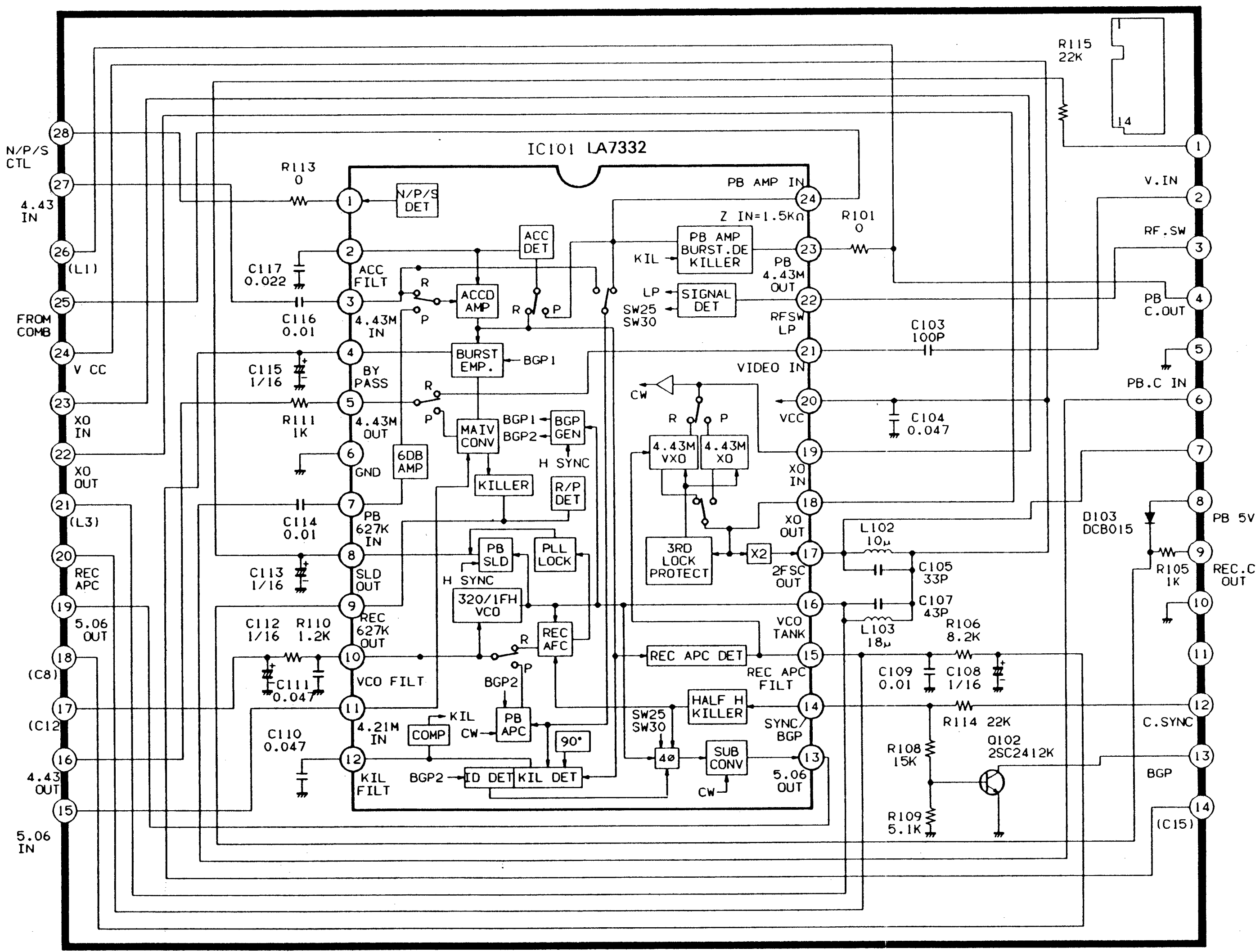
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

IC101 HIC CIRCUIT

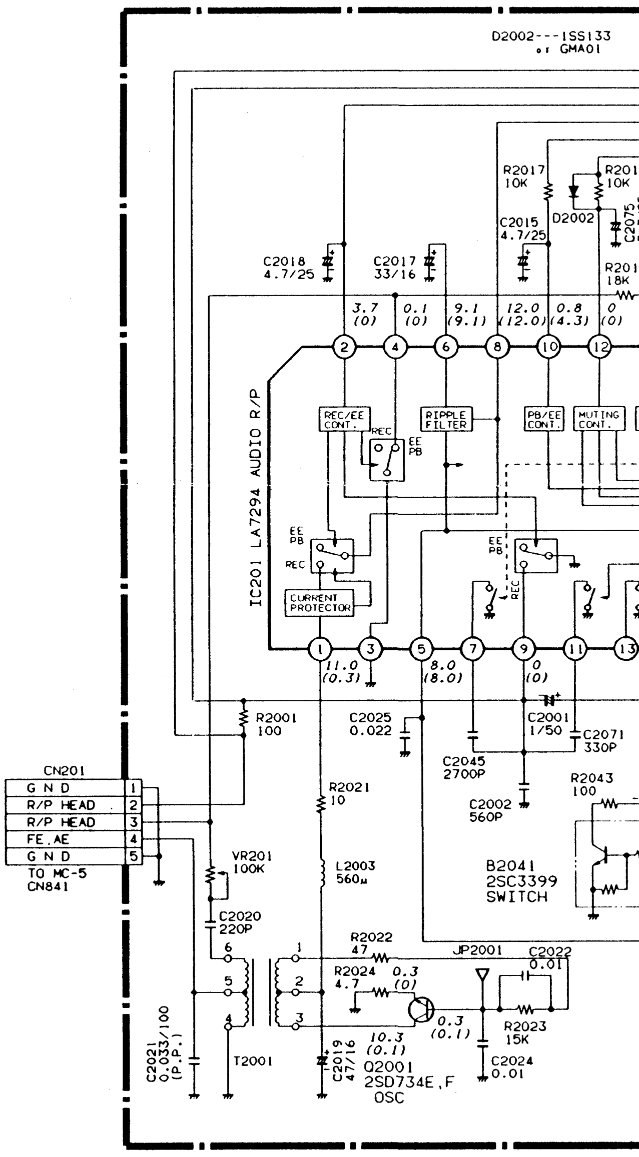


2SC2814
2SA1256
MA223
2SC3395
MA151WA
CARR SET
DEV
NOISE CANCELL
NL DE-EMPH
AMP
LIM
CORR
CLAMP
GND
FM DEMOD
MIX
LPF
LIM
HPF
DETAIL ENHAN
NL EMPHA
MAIN EMPHA
WHITE DARK CLIP
LA7322
IC1
LPF
SYNC SEP
DELAY
SYNC AMP
FBC
PIC -CONT
AMP 6DB
P.B Y/C MIX AMP
MUTE V.D.INS H.D.INS W.CLIP D.CLIP
VIDEO AMP 6DB
DRIVER
VIDEO AGC AMP
ATT
AGC DET 1
FM AGC AMP
DOC DET
AMP
AGC DET 2
1/2FH CAR. SHIFT
FM MOD
REC FM LIM
VCC
AGC
CDV1-HIC-LA7322

IC121 HIC CIRCUIT

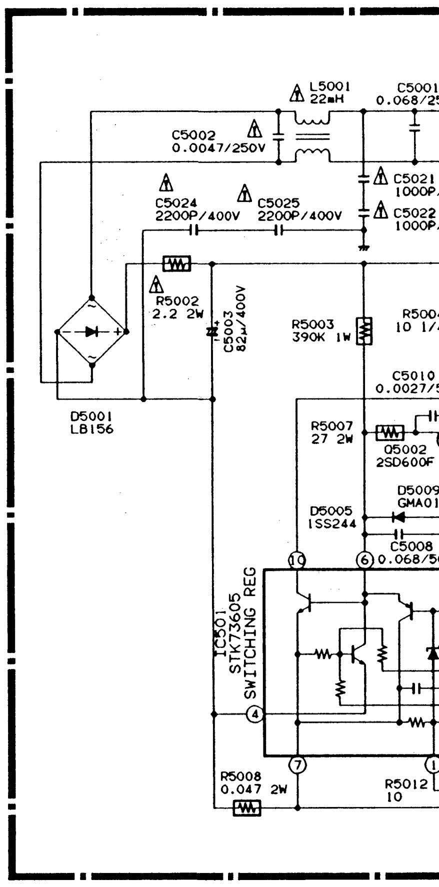


IC101 LA7332
N/P/S CTL
4.43 IN
FROM COMB
V CC
XO IN
XO OUT
REC APC
5.06 OUT
4.43 OUT
5.06 IN
N/P/S DET
ACC DET
ACC FILT
ACCD AMP
4.43M IN
BY PASS
BURST EMP.
BGP1
4.43M OUT
MAIV CONV
BGP GEN
6DB AMP
KILLER
R/P DET
PB 627K IN
PB SLD
PLL LOCK
SLD OUT
320/1FH VCO
REC 627K OUT
REC AFC
VCO FILT
4.21M IN
COMP
PB APC
90°
KIL FILT
ID DET
KIL DET
PB AMP IN
Z IN=1.5KΩ
PB AMP BURST.DE KILLER
SIGNAL DET
PB 4.43M OUT
RFSW LP
VIDEO IN
VCC
4.43M VXO
4.43M XO
XO IN
XO OUT
3RD LOCK PROTECT
X2
2FSC OUT
VCO TANK
REC APC DET
REC APC FILT
HALF H KILLER
SYNC BGP
SW25 SW30
4Ø
SUB CONV
5.06 OUT
V.IN
RF.SW
PB C.OUT
PB.C IN
PB 5V
REC.C OUT
C.SYNC
BGP
D103 DCB015
Q102 2SC2412K



D2002---1SS133 or GMA01
IC201 LA7294 AUDIO R/P
REC/EE CONT.
RIPPLE FILTER
PB/EE CONT.
MUTING CONT.
CURRENT PROTECTOR
CN201
GND
R/P HEAD
R/P HEAD
FE.AE
GND
TO MC-5 CN841
VR201 100K
T2001
Q2001 2SD734E,F OSC
B2041 2SC3399 SWITCH
JP2001

PW-1,



L5001 22mH
D5001 LB156
Q5002 2SD600F
D5005 1SS244
IC501 STK7360S SWITCHING REG

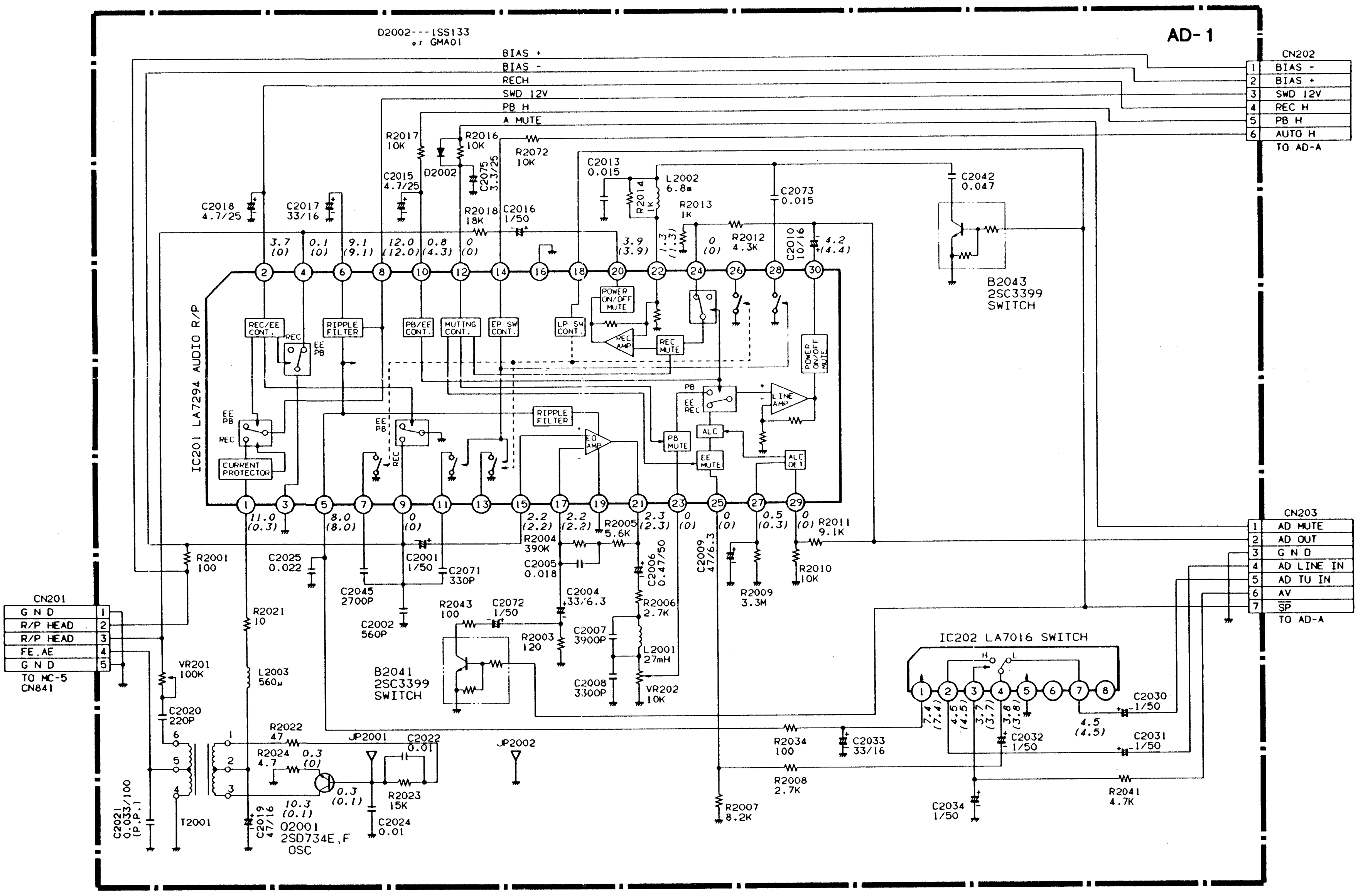
K J I H G F E D C B A

1 2 3 4 5 6 7 8 9 10 11

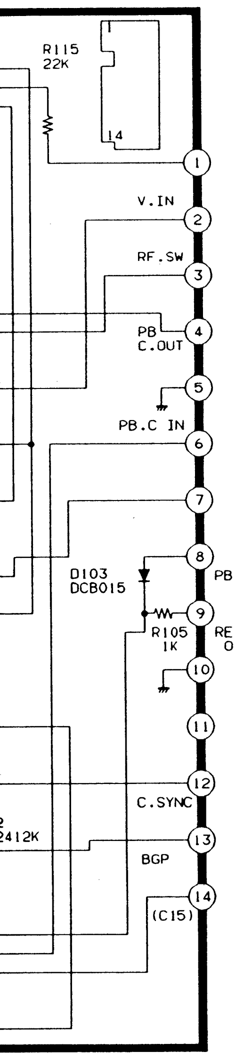
MA151WA
A7322

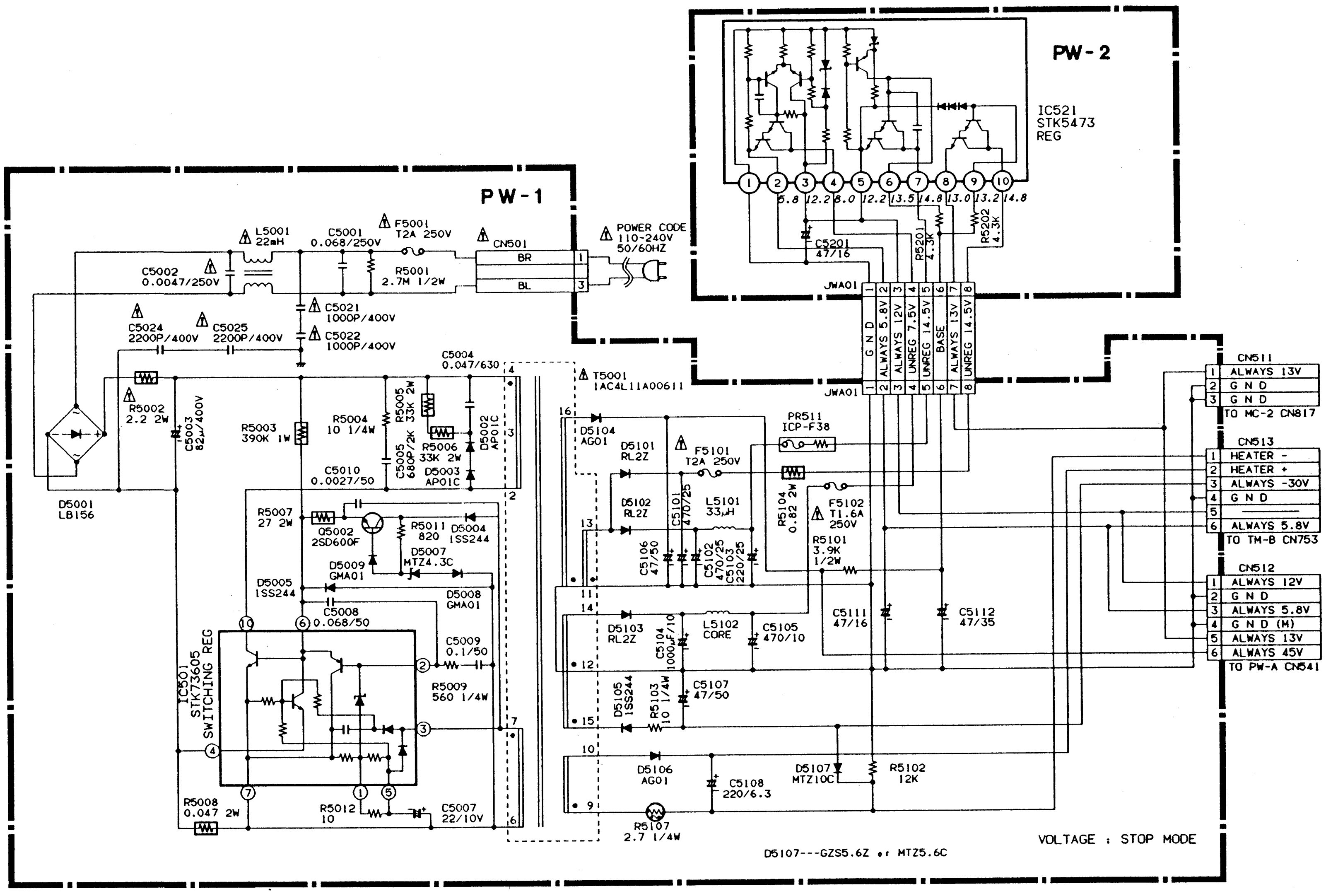
CP
TO CV-A[AD OUT (A
TO TN-A[AD IN (T
TO VD-A
VD IN (A
VD OUT (A
TO SV-A
SP
SP
VD
TO CV-A
D/K
NTSC 3.58
TO TM-A[
TO PW-A[SWD 1
TO VD-A[AUTO
TO SV-A[
TO SY-A
A MU
PB
REC
CN541
ALWAYS 12
G N D
ALWAYS 5.8
G N D(M)
ALWAYS 13
ALWAYS 45
TO PW-1 CN512

AD-1 BOARD AUDIO CIRCUIT DIAGRAM

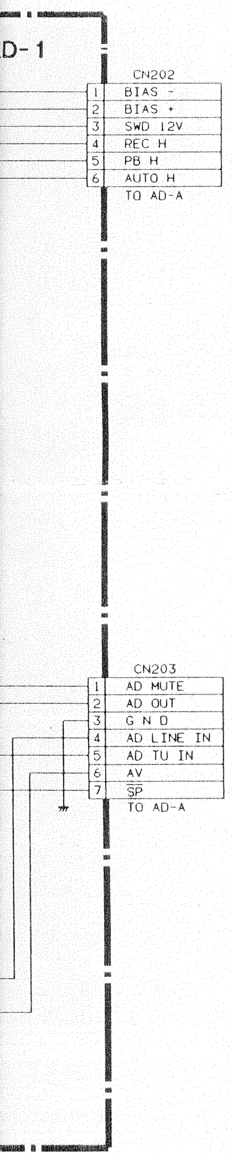

AD-1
D2002---1SS133 or GMA01
BIAS +
BIAS -
RECH
SWD 12V
PB H
A MUTE
CN202
1 BIAS -
2 BIAS +
3 SWD 12V
4 REC H
5 PB H
6 AUTO H
TO AD-A
IC201 LA7294 AUDIO R/P
REC/EE CONT.
RIPPLE FILTER
PB/EE CONT.
MUTING CONT.
EP SW CONT.
LP SW CONT.
POWER ON/OFF MUTE
REC AMP
REC MUTE
POWER ON/OFF MUTE
CURRENT PROTECTOR
RIPPLE FILTER
EQ AMP
PB MUTE
ALC
EE MUTE
LINE AMP
ALC DET
R2017 10K
R2016 10K
R2072 10K
C2015 4.7/25
C2075 3.3/25
R2018 18K
C2016 1/50
C2013 0.015
R2014 1K
L2002 6.8m
R2013 1K
C2073 0.015
R2012 4.3K
C2010 10/16
C2042 0.047
B2043 2SC3399 SWITCH
C2018 4.7/25
C2017 33/16
R2001 100
C2025 0.022
C2045 2700P
C2001 1/50
C2071 330P
R2004 390K
R2005 5.6K
C2005 0.018
C2006 0.47/50
C2009 47/6.3
R2011 9.1K
R2010 10K
R2009 3.3M
C2004 33/6.3
R2006 2.7K
R2043 100
C2072 1/50
R2003 120
C2007 3900P
L2001 27mH
C2002 560P
B2041 2SC3399 SWITCH
C2008 3300P
VR202 10K
CN201
1 G N D
2 R/P HEAD
3 R/P HEAD
4 FE.AE
5 G N D
TO MC-5 CN841
R2021 10
VR201 100K
L2003 560μ
C2020 220P
R2022 47
R2024 4.7
JP2001
C2022 0.01
JP2002
R2023 15K
C2024 0.01
C2021 0.033/100 (P.P.)
T2001
C2019 47/16
Q2001 2SD734E,F OSC
CN203
1 AD MUTE
2 AD OUT
3 G N D
4 AD LINE IN
5 AD TU IN
6 AV
7 SP
TO AD-A
IC202 LA7016 SWITCH
C2030 1/50
R2034 100
C2033 33/16
C2032 1/50
C2031 1/50
R2008 2.7K
R2041 4.7K
R2007 8.2K
C2034 1/50

PW-1, 2 BOARD POWER SUPPLY CIRCUIT DIAGRAM

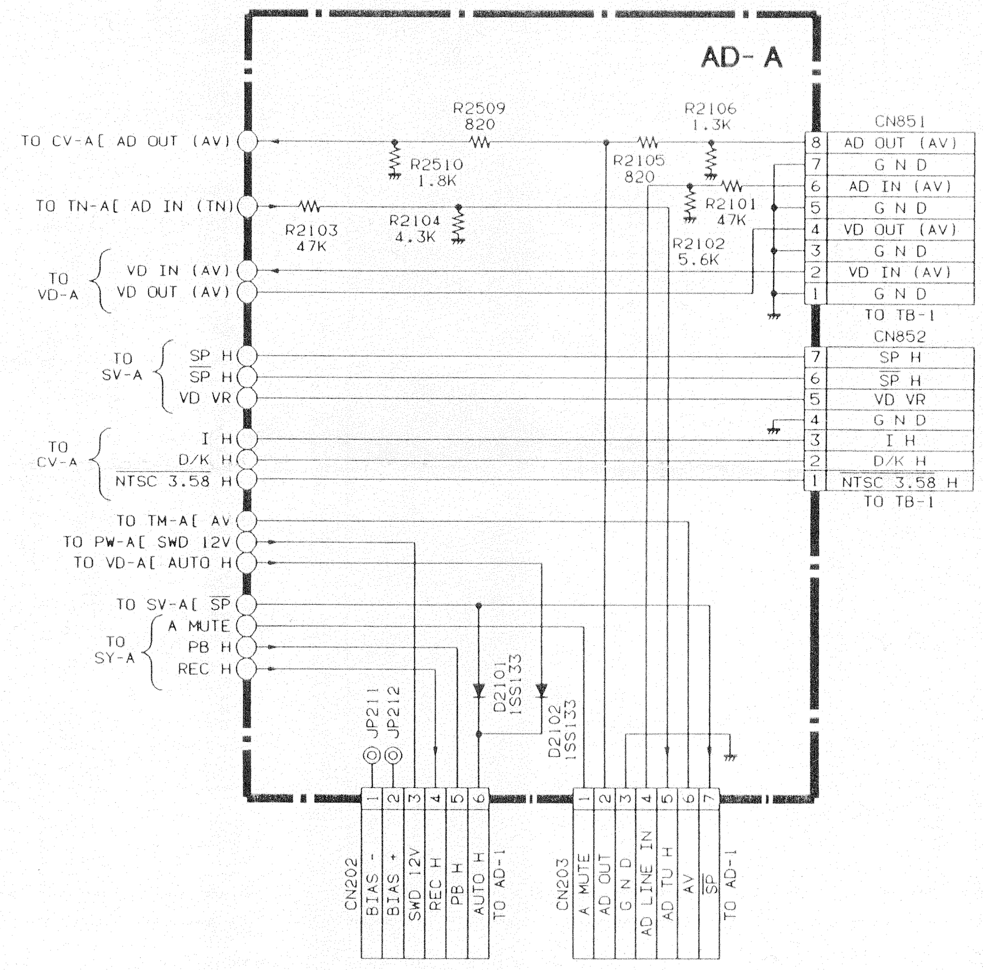

R115 22K
V.IN
RF.SW
PB C.OUT
PB.C IN
D103 DCB015
PB 5V
R105 1K
REC.C OUT
C.SYNC
BGP
(C15)


PW-2
IC521 STK5473 REG
C5201 47/16
R5201 4.3K
R5202 4.3K
JWA01
PW-1
L5001 22mH
C5001 0.068/250V
F5001 T2A 250V
CN501
BR
BL
POWER CODE 110-240V 50/60HZ
C5002 0.0047/250V
R5001 2.7M 1/2W
C5021 1000P/400V
C5022 1000P/400V
C5024 2200P/400V
C5025 2200P/400V
C5004 0.047/630
T5001 1AC4L11A00611
R5002 2.2 2W
C5003 82μ/400V
R5003 390K 1W
R5004 10 1/4W
R5005 33K 2W
C5005 680P/2K
R5006 33K 2W
D5002 AP01C
D5003 AP01C
C5010 0.0027/50
D5001 LB156
R5007 27 2W
Q5002 2SD600F
R5011 820
D5004 1SS244
D5007 MTZ4.3C
D5009 GMA01
D5005 1SS244
D5008 GMA01
C5008 0.068/50
IC5501 STK73605 SWITCHING REG
C5009 0.1/50
R5009 560 1/4W
R5008 0.047 2W
R5012 10
C5007 22/10V
D5104 AG01
PR511 ICP-F38
D5101 RL2Z
F5101 T2A 250V
D5102 RL2Z
C5101 470/25
L5101 33μH
R5104 0.82 2W
F5102 T1.6A 250V
C5106 47/50
C5102 470/25
C5103 220/25
R5101 3.9K 1/2W
D5103 RL2Z
C5104 1000μF/10
L5102 CORE
C5105 470/10
C5111 47/16
C5112 47/35
D5105 1SS244
R5103 10 1/4W
C5107 47/50
D5106 AG01
C5108 220/6.3
D5107 MTZ10C
R5102 12K
R5107 2.7 1/4W
JWA01
1 G N D
2 ALWAYS 5.8V
3 ALWAYS 12V
4 UNREG 7.5V
5 UNREG 14.5V
6 BASE
7 ALWAYS 13V
8 UNREG 14.5V
CN511
1 ALWAYS 13V
2 G N D
3 G N D
TO MC-2 CN817
CN513
1 HEATER -
2 HEATER +
3 ALWAYS -30V
4 G N D
5
6 ALWAYS 5.8V
TO TM-B CN753
CN512
1 ALWAYS 12V
2 G N D
3 ALWAYS 5.8V
4 G N D (M)
5 ALWAYS 13V
6 ALWAYS 45V
TO PW-A CN541
VOLTAGE : STOP MODE
D5107---GZS5.6Z or MTZ5.6C

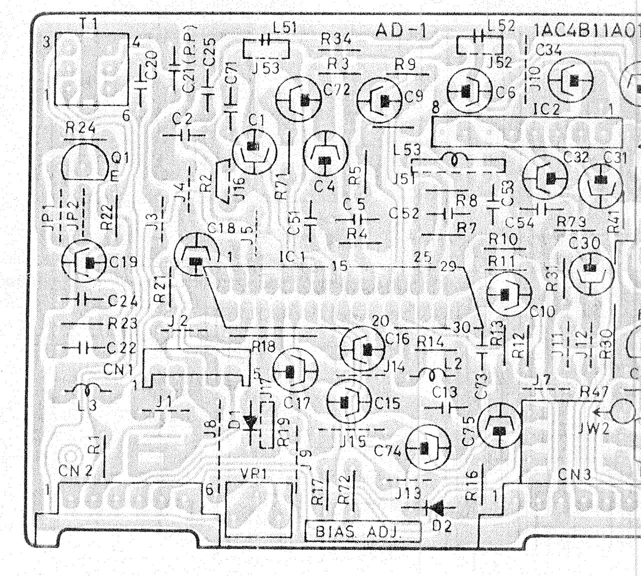
8 9 10 11 12 13 14 15 16 17 18 19

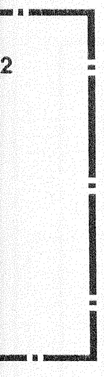

D-1
CN202
1 BIAS -
2 BIAS +
3 SWD 12V
4 REC H
5 PB H
6 AUTO H
TO AD-A
CN203
1 AD MUTE
2 AD OUT
3 G N D
4 AD LINE IN
5 AD TU IN
6 AV
7 SP
TO AD-A

CP-1 BOARD (AD-A) AUDIO CIRCUIT DIAGRAM

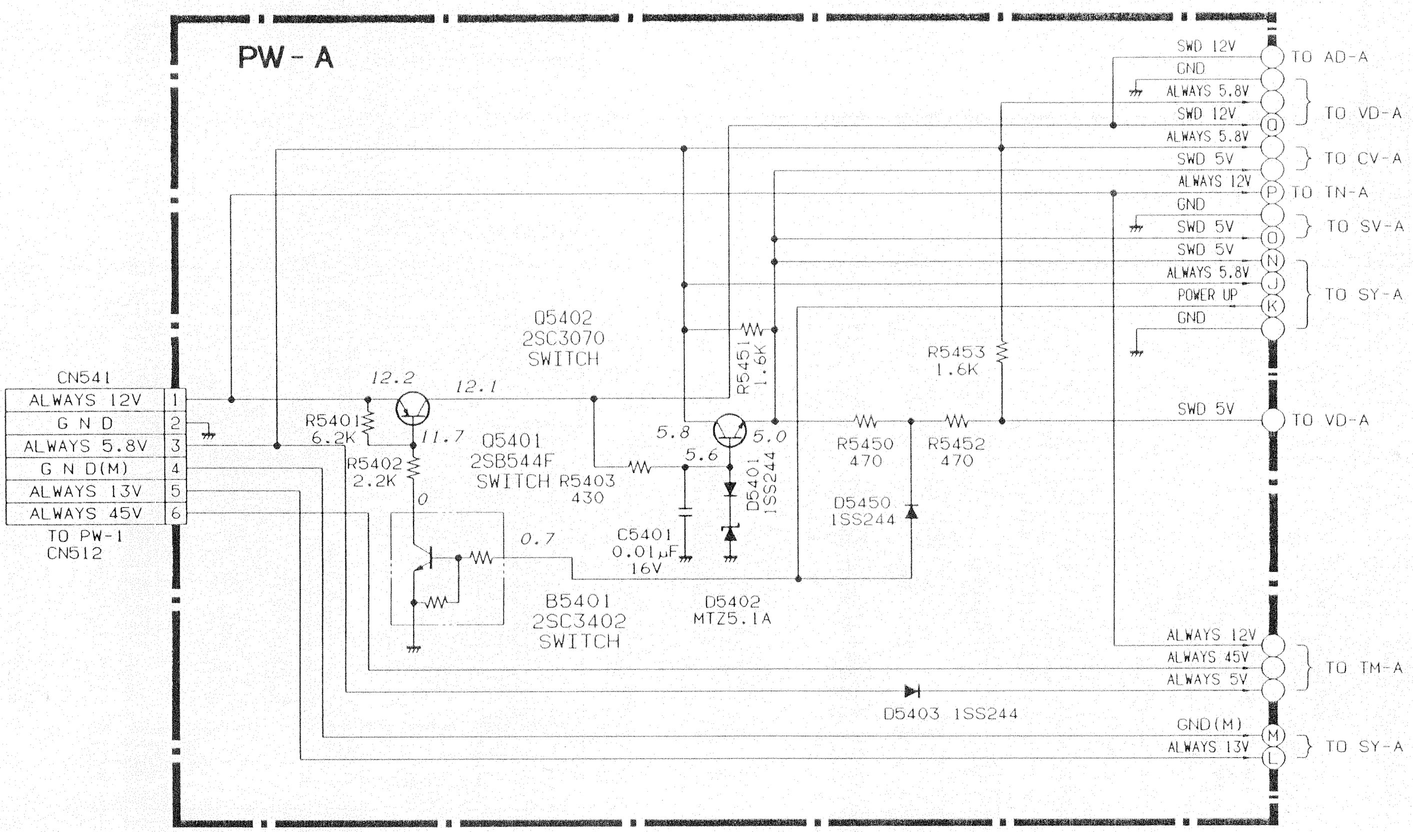

AD- A
TO CV-A[AD OUT (AV)
TO TN-A[AD IN (TN)
TO VD-A
VD IN (AV)
VD OUT (AV)
TO SV-A
SP H
SP H
VD VR
TO CV-A
I H
D/K H
NTSC 3.58 H
TO TM-A[AV
TO PW-A[SWD 12V
TO VD-A[AUTO H
TO SV-A[SP
TO SY-A
A MUTE
PB H
REC H
R2509 820
R2510 1.8K
R2103 47K
R2104 4.3K
R2106 1.3K
R2105 820
R2101 47K
R2102 5.6K
CN851
8 AD OUT (AV)
7 G N D
6 AD IN (AV)
5 G N D
4 VD OUT (AV)
3 G N D
2 VD IN (AV)
1 G N D
TO TB-1
CN852
7 SP H
6 SP H
5 VD VR
4 G N D
3 I H
2 D/K H
1 NTSC 3.58 H
TO TB-1
D2101 1SS133
D2102 1SS133
JP211
JP212
CN202 BIAS - BIAS + SWD 12V REC H PB H AUTO H TO AD-1
CN203 A MUTE AD OUT G N D AD LINE IN AD TU H AV SP TO AD-1

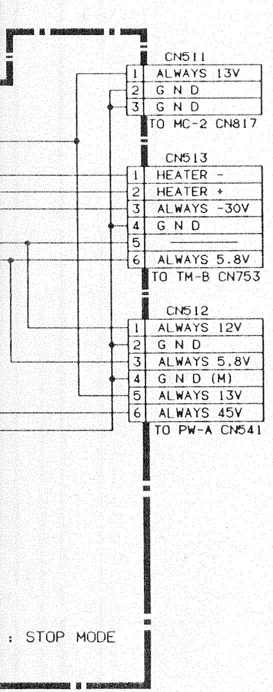
AD-1 P.C.B.


AD-1
1AC4B11A01
T1
L51
L52
R34
R3
R9
IC2
IC1
Q1
R24
BIAS ADJ
VR1
CN1
CN2
CN3
D1
D2
JW2



CP-1 BOARD (PW-A) POWER SUPPLY CIRCUIT DIAGRAM


PW - A
SWD 12V
GND
ALWAYS 5.8V
SWD 12V
ALWAYS 5.8V
SWD 5V
ALWAYS 12V
GND
SWD 5V
SWD 5V
ALWAYS 5.8V
POWER UP
GND
TO AD-A
TO VD-A
TO CV-A
TO TN-A
TO SV-A
TO SY-A
SWD 5V
TO VD-A
Q5402 2SC3070 SWITCH
Q5401 2SB544F SWITCH
B5401 2SC3402 SWITCH
R5401 6.2K
R5402 2.2K
R5403 430
R5451 1.6K
R5453 1.6K
R5450 470
R5452 470
C5401 0.01μF 16V
D5401 1SS244
D5450 1SS244
D5402 MTZ5.1A
D5403 1SS244
12.2
12.1
11.7
5.8
5.6
5.0
0
0.7
CN541
1 ALWAYS 12V
2 G N D
3 ALWAYS 5.8V
4 G N D(M)
5 ALWAYS 13V
6 ALWAYS 45V
TO PW-1 CN512
ALWAYS 12V
ALWAYS 45V
ALWAYS 5V
TO TM-A
GND(M)
ALWAYS 13V
TO SY-A

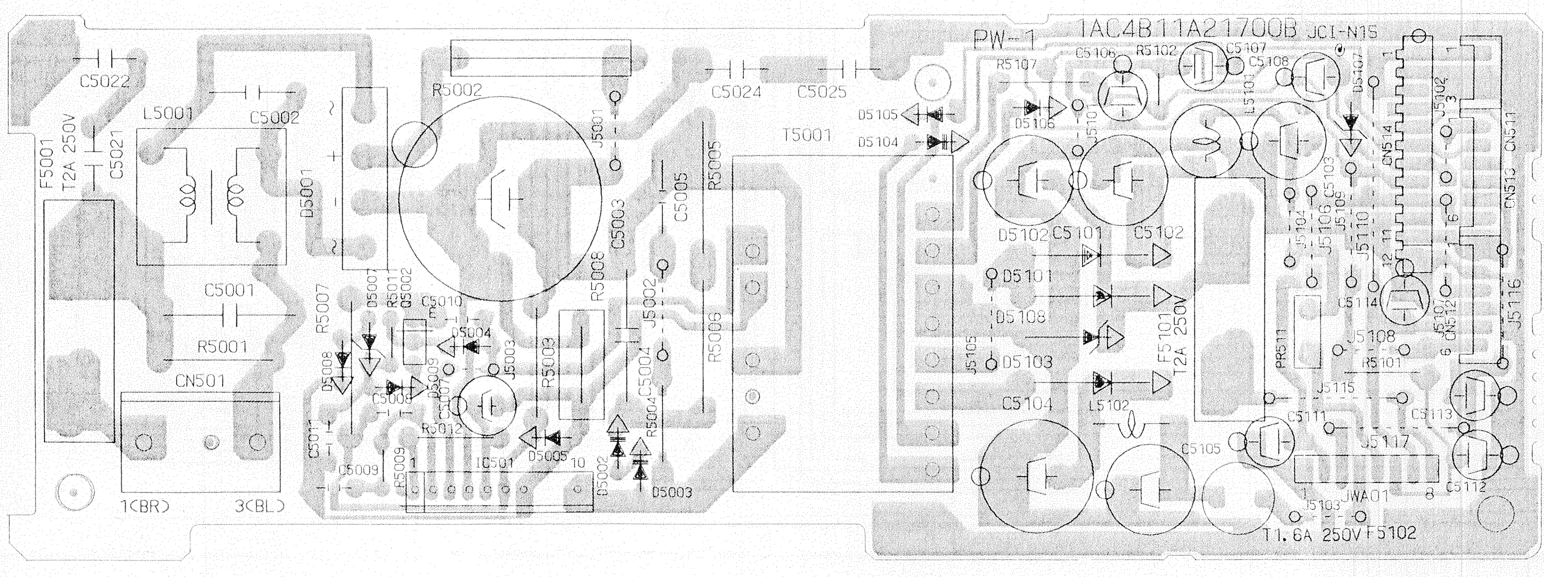

CN511
1 ALWAYS 13V
2 G N D
3 G N D
TO MC-2 CN817
CN513
1 HEATER -
2 HEATER +
3 ALWAYS -30V
4 G N D
5
6 ALWAYS 5.8V
TO TM-B CN753
CN512
1 ALWAYS 12V
2 G N D
3 ALWAYS 5.8V
4 G N D (M)
5 ALWAYS 13V
6 ALWAYS 45V
TO PW-A CN541
: STOP MODE

NOTES:
1. All resistance values in "C
M = 1,000,000)
2. All capacitance values in "/
p = pico farad
3. All inductance values in
henry

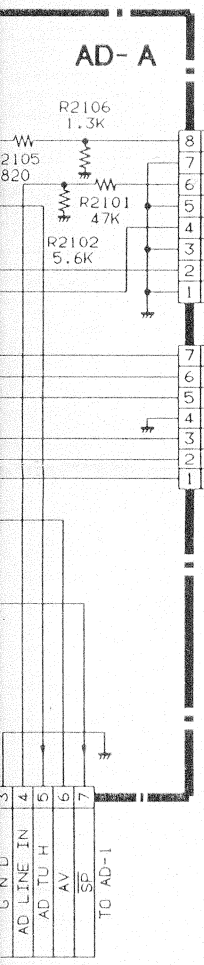
PRODU

THE COMPONENTS DESIG
SCHEMATIC DIAGRAM
VALUE ARE OF SPECIAL
SHOULD ANY COMPONEN
TO BE REPLACED, USE
PARTS LIST. DO NOT DEV
TAGE AND VOLTAGE RATI

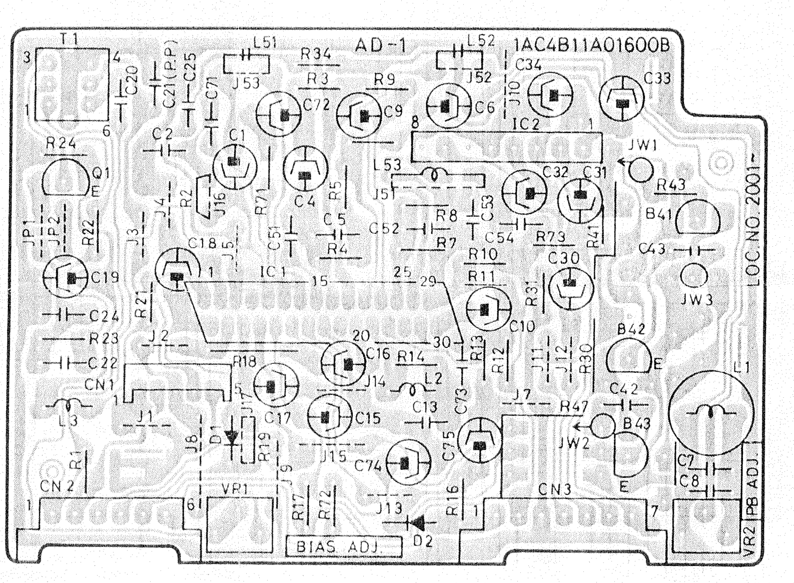
PW-1 P.C.B.


PW-1
1AC4B11A21700B JCI-N15
F5001 T2A 250V
C5021
C5022
L5001
C5002
C5001
R5001
CN501
1(BR)
3(BL)
R5002
D5001
R5007
R5009
R5008
R5006
R5005
C5003
C5005
C5024
C5025
T5001
D5105
D5104
D5102
C5101
C5102
D5101
D5108
D5103
C5104
F5101 T2A 250V
C5105
JWA01
T1.6A 250V F5102
C5113
C5112
J5116
D5003
D5005
IC501

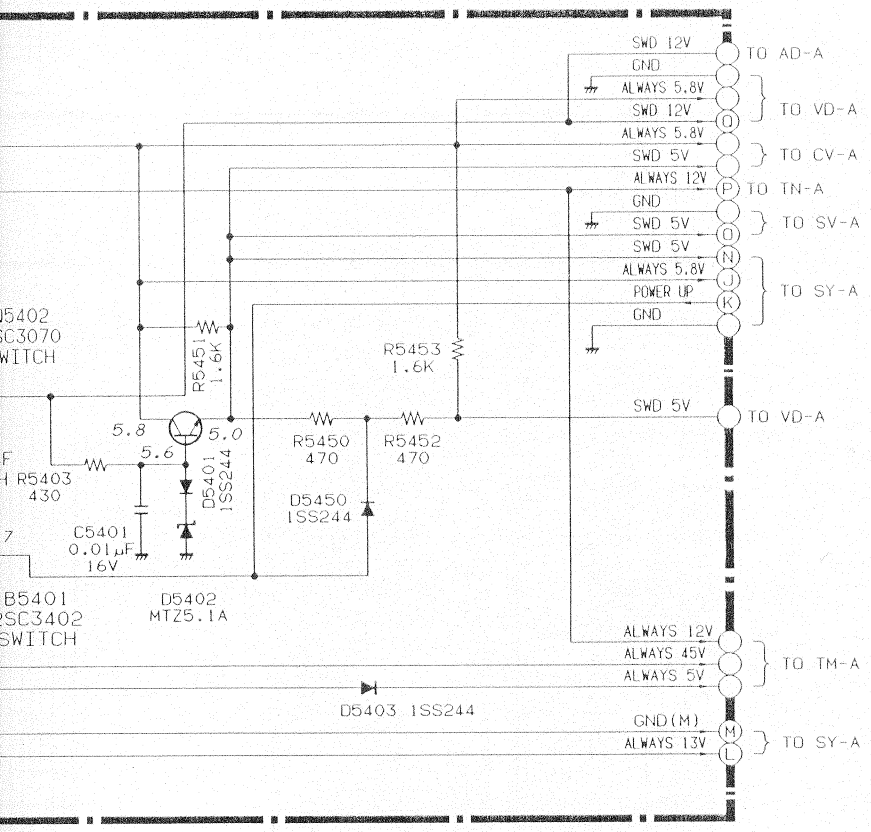
RCUIT DIAGRAM


AD- A
R2106
1.3K
R2105
820
R2101
47K
R2102
5.6K
CN851
8 AD OUT (AV)
7 GND
6 AD IN (AV)
5 GND
4 VD OUT (AV)
3 GND
2 VD IN (AV)
1 GND
TO TB-1
CN852
7 SP H
6 SP H
5 VD VR
4 GND
3 I H
2 D/K H
1 NTSC 3.58 H
TO TB-1
GND
AD LINE IN
AD TU H
AV
SP
TO AD-1

AD-1 P.C.B.


AD-1
1AC4B11A01600B
LOC.NO.2001
T1
IC1
IC2
CN1
CN2
CN3
VR1
BIAS ADJ.
VR2 PB ADJ.
JW1
JW2
JW3
L1
L2
L3
Q1
D1
D2

V-A) POWER SUPPLY CIRCUIT DIAGRAM


SWD 12V
GND
ALWAYS 5.8V
SWD 12V
ALWAYS 5.8V
SWD 5V
ALWAYS 12V
GND
SWD 5V
SWD 5V
ALWAYS 5.8V
POWER UP
GND
TO AD-A
TO VD-A
TO CV-A
TN-A
TO SV-A
TO SY-A
SWD 5V
TO VD-A
Q5402
2SC3070
SWITCH
R5451
1.6K
R5453
1.6K
R5450
470
R5452
470
R5403
430
5.8
5.6
5.0
D5401
1SS244
D5450
1SS244
C5401
0.01μF
16V
Q5401
2SC3402
SWITCH
D5402
MTZ5.1A
ALWAYS 12V
ALWAYS 45V
ALWAYS 5V
TO TM-A
D5403 1SS244
GND(M)
ALWAYS 13V
TO SY-A

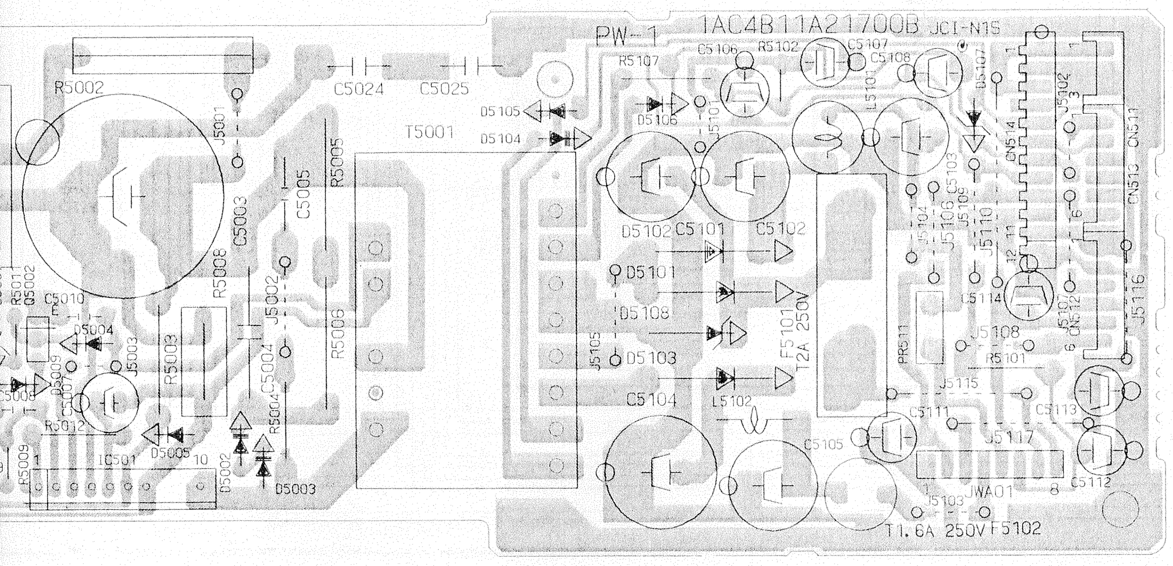
NOTES:

1. All resistance values in "OHMS" unless otherwise noted. (K = 1,000 M = 1,000,000)
2. All capacitance values in "μfd" unless otherwise noted. p = pico farad
3. All inductance values in "mH" unless otherwise noted. μ = micro henry

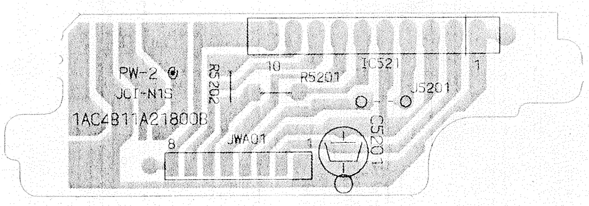
PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SIMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

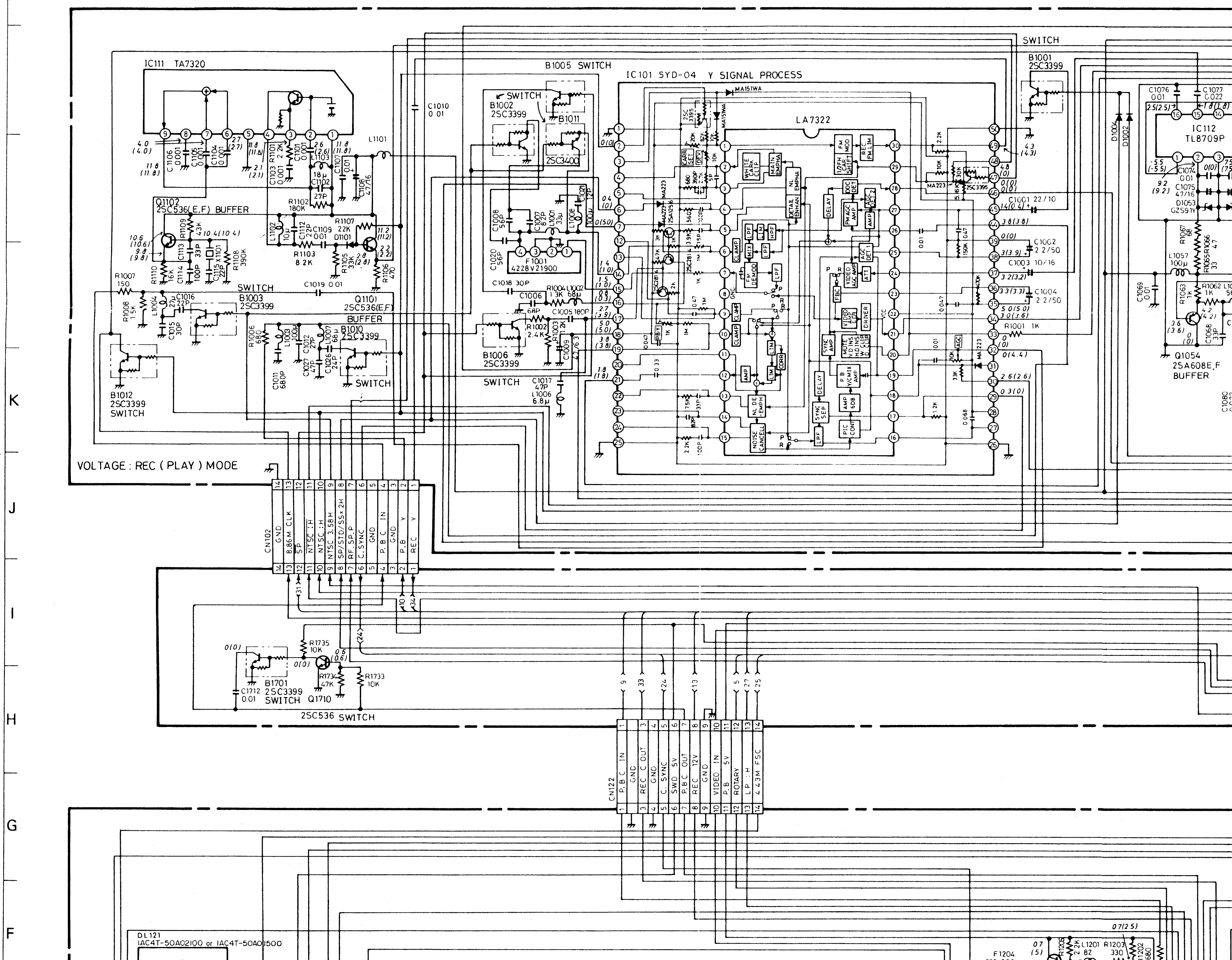
PW-1 P.C.B.


PW-1
1AC4B11A21700B JCI-N15
R5002
C5024
C5025
T5001
D5105
D5104
D5102
C5101
C5102
D5101
D5108
D5103
C5104
F5101
T2A 250V
T1.6A 250V F5102
JWA01
C5112
C5113
D5003

PW-2 P.C.B.

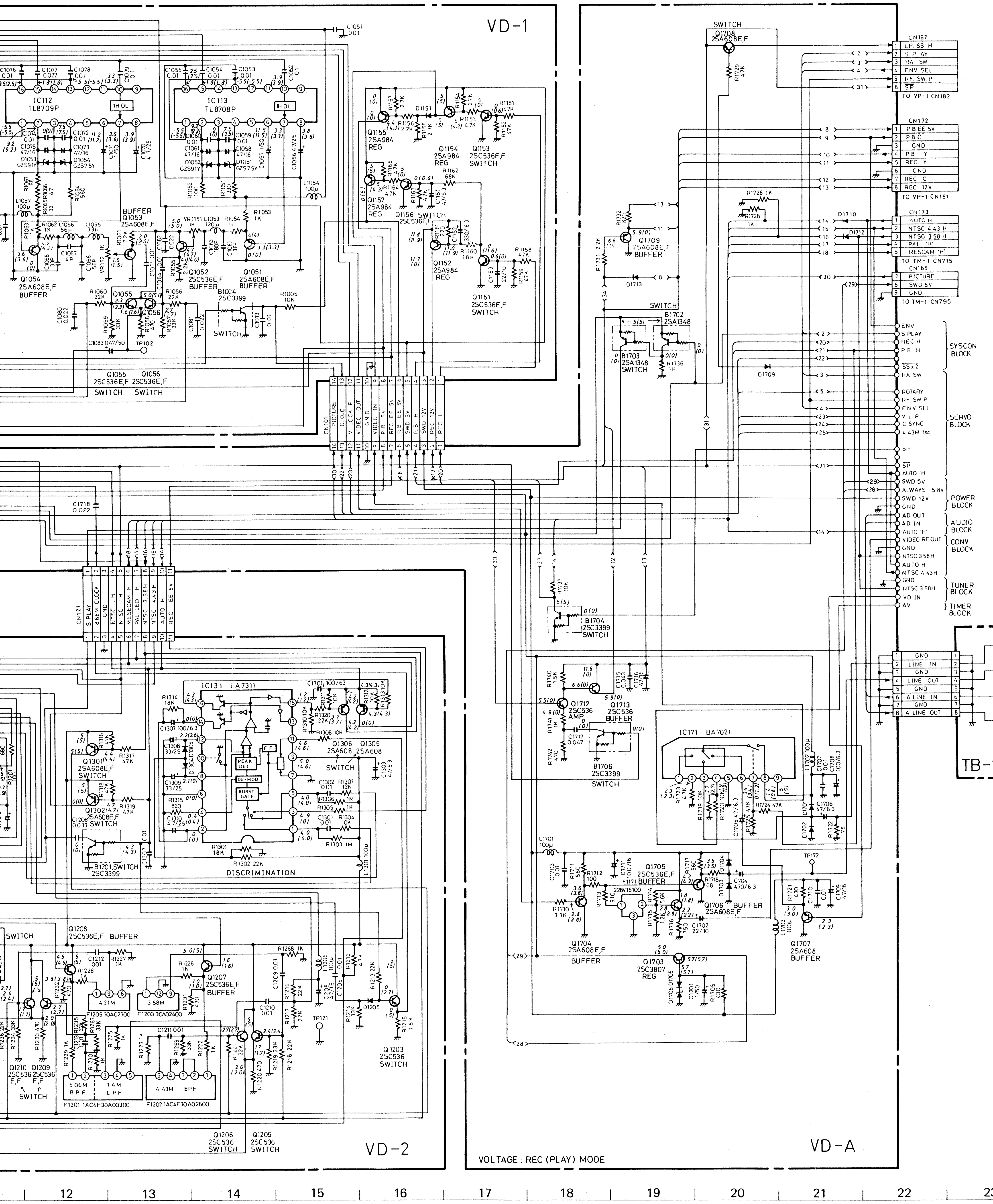

PW-2
JCI-N15
1AC4B11A21800B
R5201
IC521
J5201
JWA01

CP-1 BOARD (VD-A) VIDEO CONNECTION. INPUT SELECT CIRCUIT DIAGRAM VD-1 BOARD VIDEO Y SIGNAL PROCE

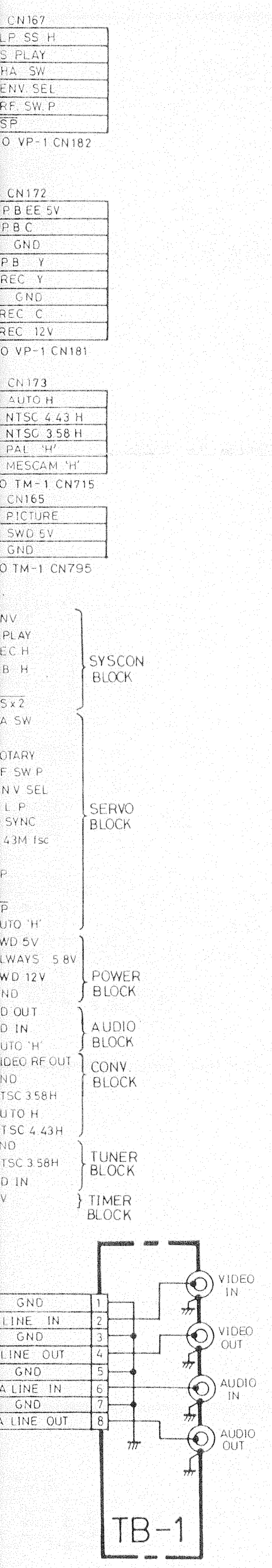


IC111 TA7320
Q1102 2SC536(E,F) BUFFER
Q1101 2SC536(E,F) BUFFER
B1003 2SC3399 SWITCH
B1010 2SC3399 SWITCH
B1012 2SC3399 SWITCH
B1005 SWITCH
B1002 2SC3399
B1011
2SC3400
B1006 2SC3399 SWITCH
F1001 4228V21900
IC101 SYD-04 Y SIGNAL PROCESS
LA7322
MA151WA
SWITCH
B1001 2SC3399
IC112 TL8709P
Q1054 2SA608E,F BUFFER
VOLTAGE : REC (PLAY) MODE
CN102
GND
8.86M CLK
SP
NTSC : H
NTSC 3.58H
SP/ST10/SS>2H
RF. SP. P
C. SYNC
GND
P. B. C IN
GND
P. B Y
REC Y
B1701 2SC3399 SWITCH
Q1710 2SC536 SWITCH
CN122
P. B. C IN
GND
REC C OUT
GND
C. SYNC
SWD 5V
P. B. C OUT
REC 12V
GND
VIDEO IN
P. B. 5V
ROTARY
LP : H
4.43M FSC
DL121 IAC4T-50A02100 or IAC4T-50A01500
4.43M 2HDL
Q1218 2SC536 SWITCH
DL122 50A01000 4.43M 1HDL
Q1217 2SC536 SWITCH
DL123 50A00200 3.58M 1HDL
Q1216 2SC536 SWITCH
Q1215 2SC536 BUFFER
Q1214 2SC536 AMP
Q1213 2SC536 BUFFER
IC101 LA7332
IC 121 1430208V02831 C SIGNAL PROCESS
Q102 2SC2412K
F1204 953V230
Q1202 2SC536E,F BUFFER
Q1201 2SC536E,F AMP
Q1212 2SC536E,F
Q1211 2SC536 SWITCH
Q1210 2SC536 E,F
Q1209 2SC536 E,F
SWITCH
VOLTAGE : REC (PLAY) MODE
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8
9
10
11
12

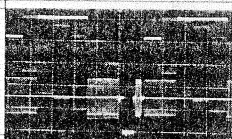
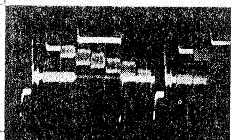
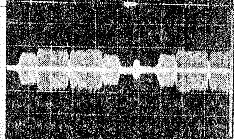
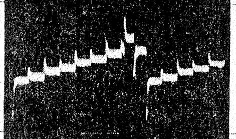
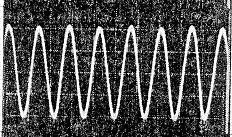
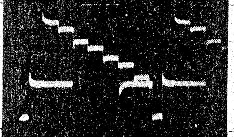
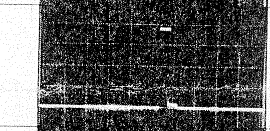
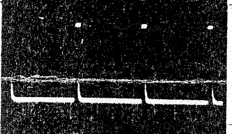
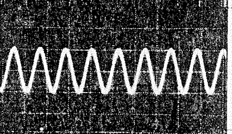
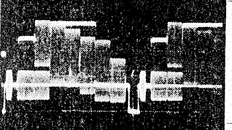
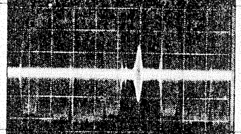
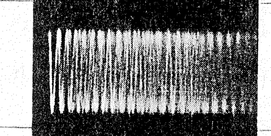
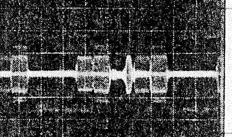
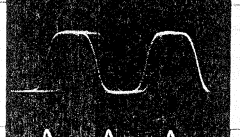
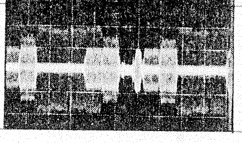
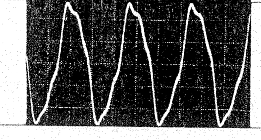
IAL PROCESS CIRCUIT DIAGRAM   VD-2 BOARD VIDEO C SIGNAL PROCESS CIRCUIT DIAGRAM


VD-1
IC112 TL8709P
IC113 TL8708P
1H DL
Q1054 2SA608E,F BUFFER
Q1053 2SA608E,F BUFFER
Q1052 2SC536E,F BUFFER
Q1051 2SA608E,F BUFFER
Q1055 Q1056 2SC536E,F 2SC536E,F SWITCH SWITCH
B1004 2SC3399 SWITCH
TP102
Q1155 2SA984 REG
Q1154 2SA984 REG
Q1153 2SC536E,F SWITCH
Q1157 2SA984 REG
Q1156 SWITCH 2SC536E,F
Q1152 2SA984 REG
Q1151 2SC536E,F SWITCH
CN101
PICTURE
D.O.C
V. LOCK P
VIDEO OUT
GND
VIDEO IN
P.B 5V
REC EE 5V
P.B EE 5V
SWD 5V
P.B H
SWD 12V
REC 12V
REC H
C1718 0.022
CN121
S. PLAY
8.86M CLOCK
GND
NTSC H
NTSC
MESECAM H
PAL LED H
NTSC 3.58H
NTSC 4.43H
AUTO H
REC EE 5V
IC131 LA7311
PEAK DET
DE-MOD
BURST GATE
F.F
DISCRIMINATION
Q1301 2SA608E,F SWITCH
Q1302 2SA608E,F SWITCH
B1201 SWITCH 2SC3399
Q1306 Q1305 2SA608 2SA608 SWITCH
Q1208 2SC536E,F BUFFER
Q1207 2SC536E,F BUFFER
F1205 30A02300 4.21M
F1203 30A02400 3.58M
F1201 1AC4F30A00300 5.06M BPF 1.4M LPF
F1202 1AC4F30A02600 4.43M BPF
Q1210 Q1209 2SC536 2SC536 E,F E,F SWITCH
Q1206 2SC536 SWITCH
Q1205 2SC536 SWITCH
Q1203 2SC536 SWITCH
TP121
VD-2
SWITCH Q1708 2SA608E,F
CN167
LP SS H
S PLAY
HA SW
ENV SEL
RF SW.P
SP
TO VP-1 CN182
CN172
P.B EE 5V
P.B C
GND
PB Y
REC Y
GND
REC C
REC 12V
TO VP-1 CN181
CN173
AUTO H
NTSC 4.43 H
NTSC 3.58 H
PAL 'H'
MESECAM 'H'
TO TM-1 CN715
CN165
PICTURE
SWD 5V
GND
TO TM-1 CN795
Q1709 2SA608E,F BUFFER
SWITCH B1702 2SA1348
B1703 2SA1348 SWITCH
ENV
S.PLAY
REC H
P.B H
SS×2
HA SW
SYSCON BLOCK
ROTARY
RF SW P
ENV SEL
V.L.P
C SYNC
4.43M fsc
SP
SP
AUTO 'H'
SERVO BLOCK
SWD 5V
ALWAYS 5.8V
SWD 12V
GND
POWER BLOCK
AD OUT
AD IN
AUTO 'H'
AUDIO BLOCK
VIDEO RF OUT
GND
NTSC 3.58H
AUTO H
NTSC 4.43H
CONV BLOCK
GND
NTSC 3.58H
VD IN
TUNER BLOCK
AV
TIMER BLOCK
B1704 2SC3399 SWITCH
Q1712 2SC536 AMP
Q1713 2SC536 BUFFER
B1706 2SC3399 SWITCH
IC171 BA7021
GND
LINE IN
GND
LINE OUT
GND
A LINE IN
GND
A LINE OUT
TB-1
Q1705 2SC536E,F F1171 BUFFER
Q1706 2SA608E,F BUFFER
Q1704 2SA608E,F BUFFER
Q1703 2SC3807 REG
Q1707 2SA608 BUFFER
TP172
VD-A
12
13
14
15
16
17
18
19
20
21
22
23

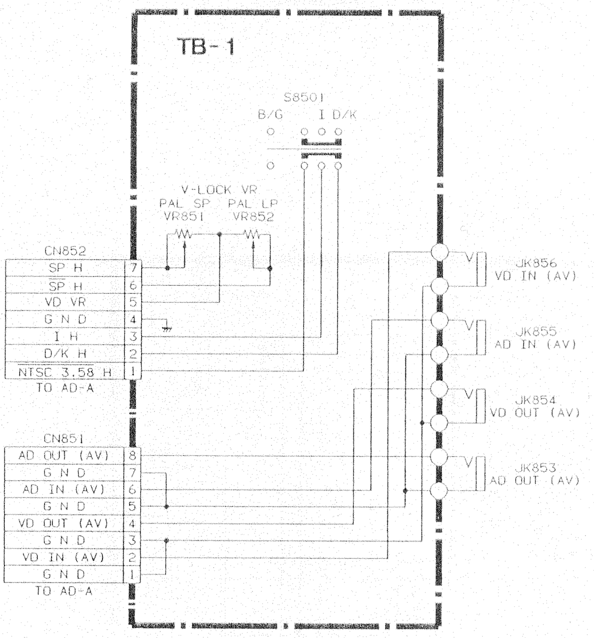
VOLTAGE : REC (PLAY) MODE


CN167
LP SS H
S PLAY
HA SW
ENV SEL
RF SW P
SP
O VP-1 CN182
CN172
P.B EE 5V
P.B C
GND
P.B Y
REC Y
GND
REC C
REC 12V
O VP-1 CN181
CN173
AUTO H
NTSC 4.43 H
NTSC 3.58 H
PAL 'H'
MESCAM 'H'
O TM-1 CN715
CN165
PICTURE
SWD 5V
GND
O TM-1 CN795
NV
PLAY
EC H
B H
Sx2
A SW
SYSCON BLOCK
OTARY
F SW P
N V SEL
L P
SYNC
43M fsc
P
P
UTO 'H'
SERVO BLOCK
WD 5V
LWAYS 5.8V
WD 12V
ND
POWER BLOCK
D OUT
D IN
UTO 'H'
AUDIO BLOCK
IDEO RF OUT
ND
TSC 3.58H
UTO H
TSC 4.43H
CONV. BLOCK
ND
TSC 3.58H
D IN
V
TUNER BLOCK
TIMER BLOCK
GND 1
LINE IN 2
GND 3
LINE OUT 4
GND 5
A LINE IN 6
GND 7
A LINE OUT 8
VIDEO IN
VIDEO OUT
AUDIO IN
AUDIO OUT
TB-1

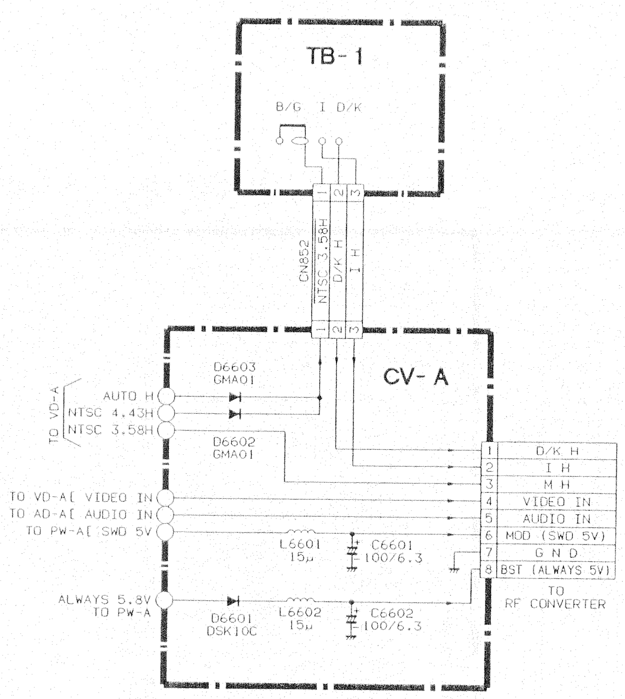
WAVEFORM OF VIDEO

Pin No.			Pin No.		
IC121 ②		REC/EE 0.2 V/div 10 μs/div	IC101 ④		REC/EE 0.2/div
⑥		PLAY 0.2 V/div 10 μs/div	⑭		PLAY 10 mV/div
⑦		REC/PLAY 0.1 V/div 7.16 MHz/8.86 MHz	㉑		PLAY 10 mV/div
⑫		REC/PLAY H SYNC 1 V/div	㉙		PLAY/REC/EE 3.8 Vp-p
⑮		REC/PLAY 50 mV/div 4.21 MHz/5.06 MHz	㉞		REC/EE1 2 Vp-p
㉕		PLAY 50 mV/div 10 μs/div	㊹		PLAY 400 mVp-p
㉗		REC 50 mV/div 10 μs/div	㊾		REC 1.5 Vp-p
CN122 ③		REC 50 mV/div	Q1213 Emitter		REC/PLAY 3.58/4.43 MHz 0.2 V/div

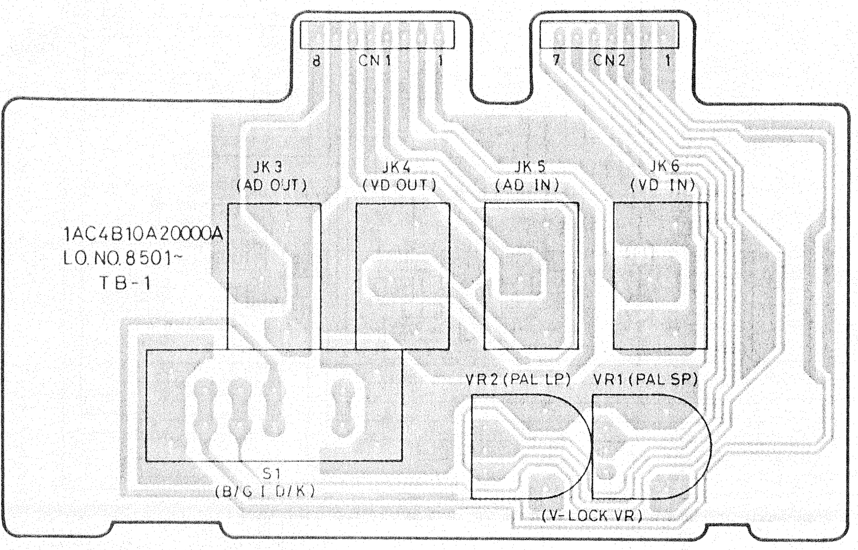
TB-1 BOARD TERMINAL CIRCUIT DIAGRAM


TB-1
S8501
B/G I D/K
V-LOCK VR
PAL SP PAL LP
VR851 VR852
CN852
SP H 7
SP H 6
VD VR 5
G N D 4
I H 3
D/K H 2
NTSC 3.58 H 1
TO AD-A
CN851
AD OUT (AV) 8
G N D 7
AD IN (AV) 6
G N D 5
VD OUT (AV) 4
G N D 3
VD IN (AV) 2
G N D 1
TO AD-A
JK856 VD IN (AV)
JK855 AD IN (AV)
JK854 VD OUT (AV)
JK853 AD OUT (AV)

CP-1 BOARD (CV-A) RF CONVERTER CONNECTION CIRCUIT DIAGRAM

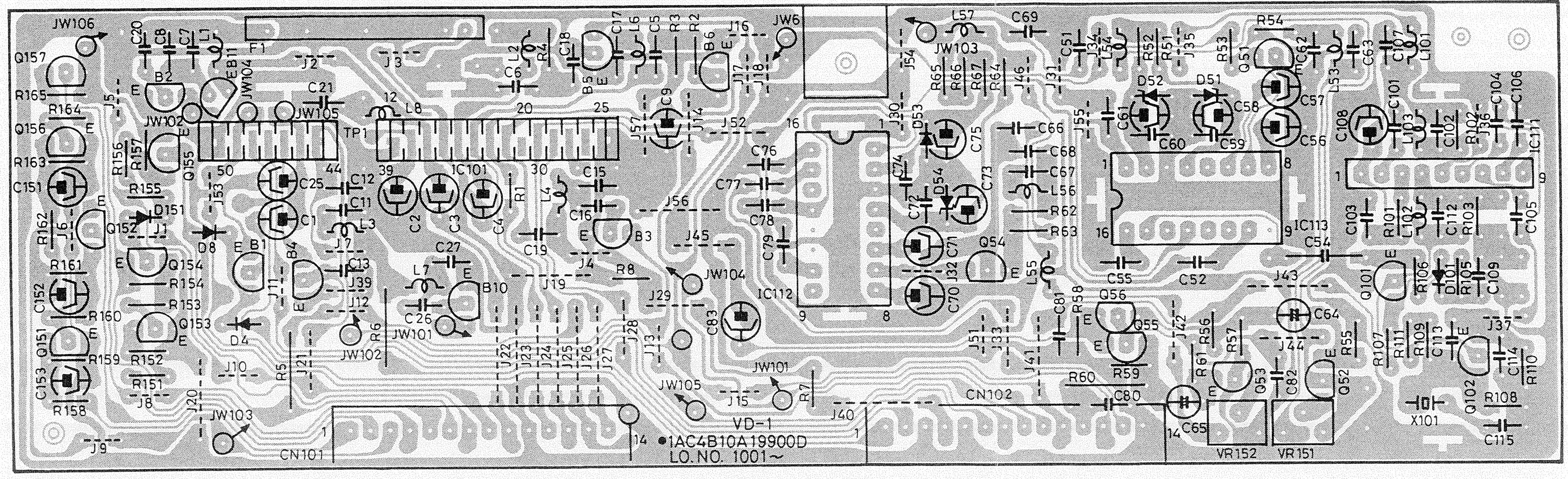

TB-1
B/G I D/K
CN852
1 2 3
NTSC 3.58H
D/K H
I H
CV-A
D6603
GMA01
TO VD-A
AUTO H
NTSC 4.43H
NTSC 3.58H
D6602
GMA01
TO VD-A[VIDEO IN
TO AD-A[AUDIO IN
TO PW-A[SWD 5V
L6601
15μ
C6601
100/6.3
ALWAYS 5.8V
TO PW-A
D6601
DSK10C
L6602
15μ
C6602
100/6.3
1 D/K H
2 I H
3 M H
4 VIDEO IN
5 AUDIO IN
6 MOD (SWD 5V)
7 G N D
8 BST (ALWAYS 5V)
TO RF CONVERTER

TB-1 P.C.B.

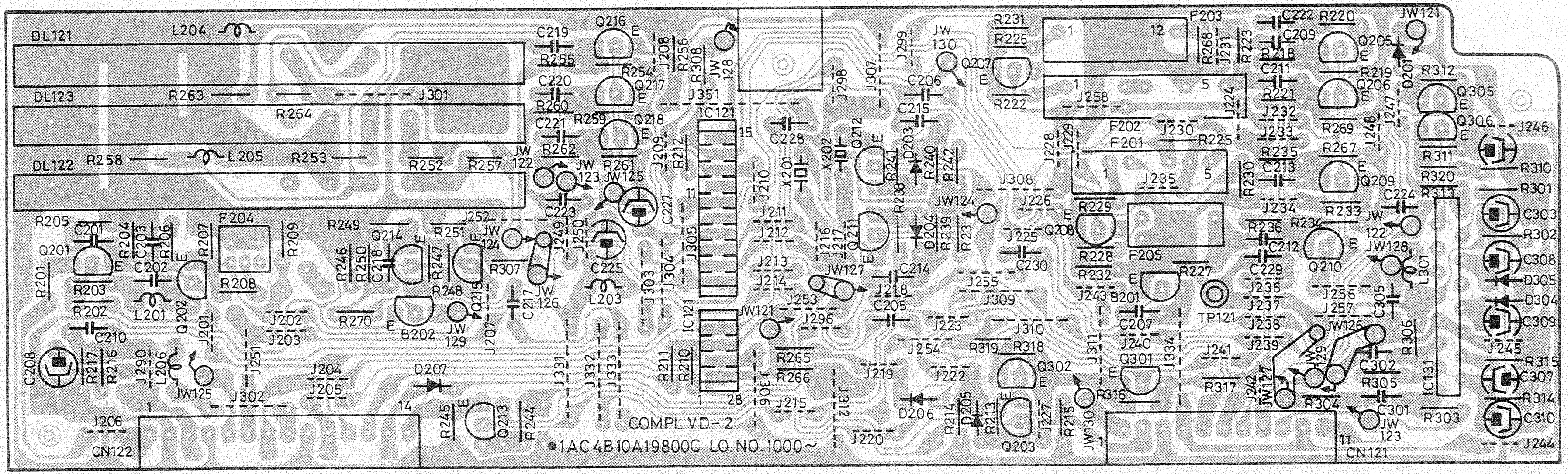

8 CN1 1
7 CN2 1
JK3 (AD OUT)
JK4 (VD OUT)
JK5 (AD IN)
JK6 (VD IN)
1AC4B10A20000A
LO.NO.8501~
TB-1
VR2 (PAL LP)
VR1 (PAL SP)
S1 (B/G I D/K)
(V-LOCK VR)

K
J
I
H
G
F
E
D
C
B
A

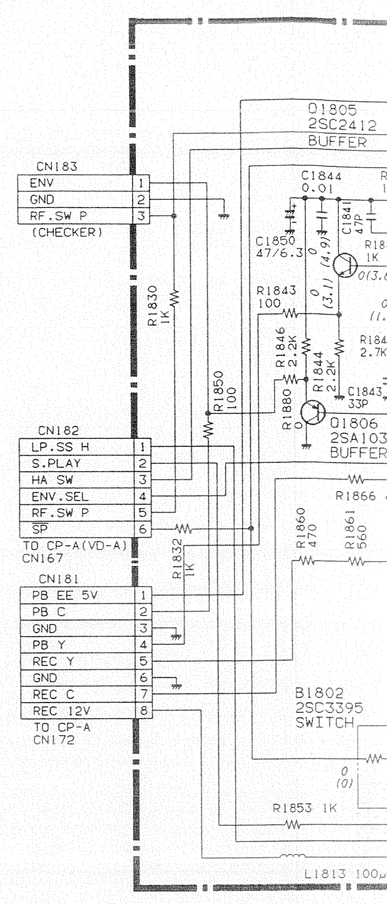
VD-1 P.C.B.

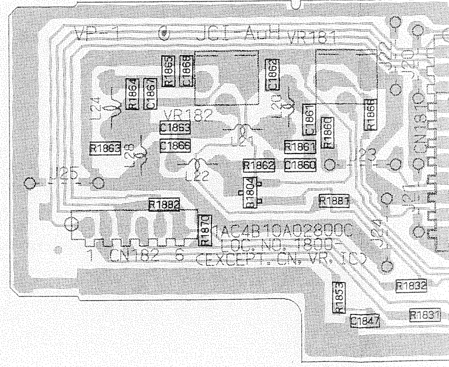

VD-1
●1AC4B10A19900D
LO.NO. 1001~
CN101
CN102
IC101
IC112
IC113
VR152
VR151
X101
TP1

VD-2 P.C.B.

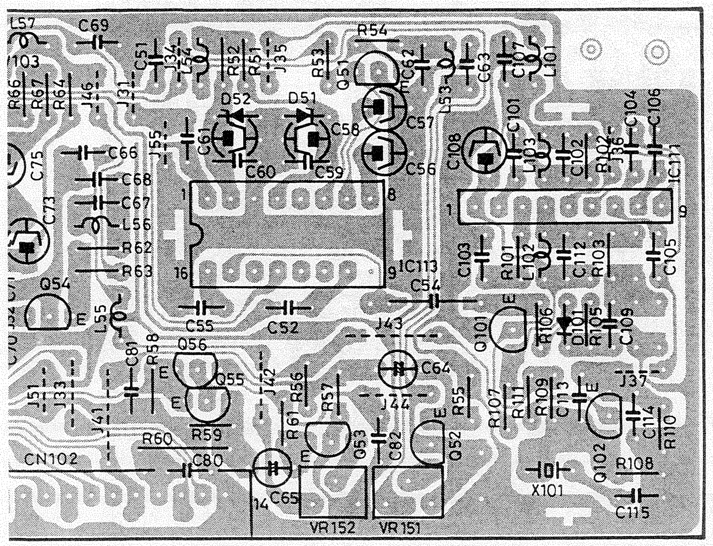

COMPL VD-2
●1AC4B10A19800C LO.NO.1000~
CN122
CN121
IC121
IC131
DL121
DL123
DL122
TP121

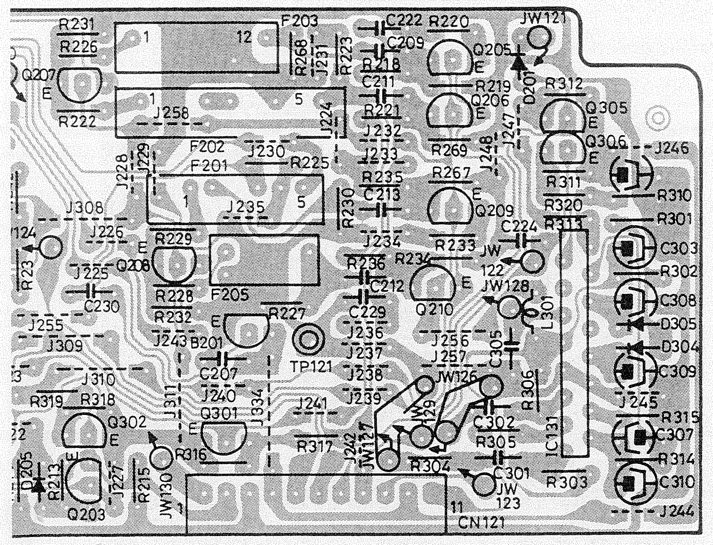
VP-1


CN183
ENV 1
GND 2
RF.SW P 3
(CHECKER)
CN182
LP.SS H 1
S.PLAY 2
HA SW 3
ENV.SEL 4
RF.SW P 5
SP 6
TO CP-A(VD-A)
CN167
CN181
PB EE 5V 1
PB C 2
GND 3
PB Y 4
REC Y 5
GND 6
REC C 7
REC 12V 8
TO CP-A
CN172
Q1805
2SC2412
BUFFER
C1844
0.01
C1841
47P
C1850
47/6.3
R1843
100
R1830
1K
R1846
2.2K
R1844
2.2K
C1843
33P
R1850
100
R1880
0
Q1806
BUFFER
R1866
R1860
470
R1861
560
R1832
1K
B1802
2SC3395
SWITCH
R1853 1K
L1813

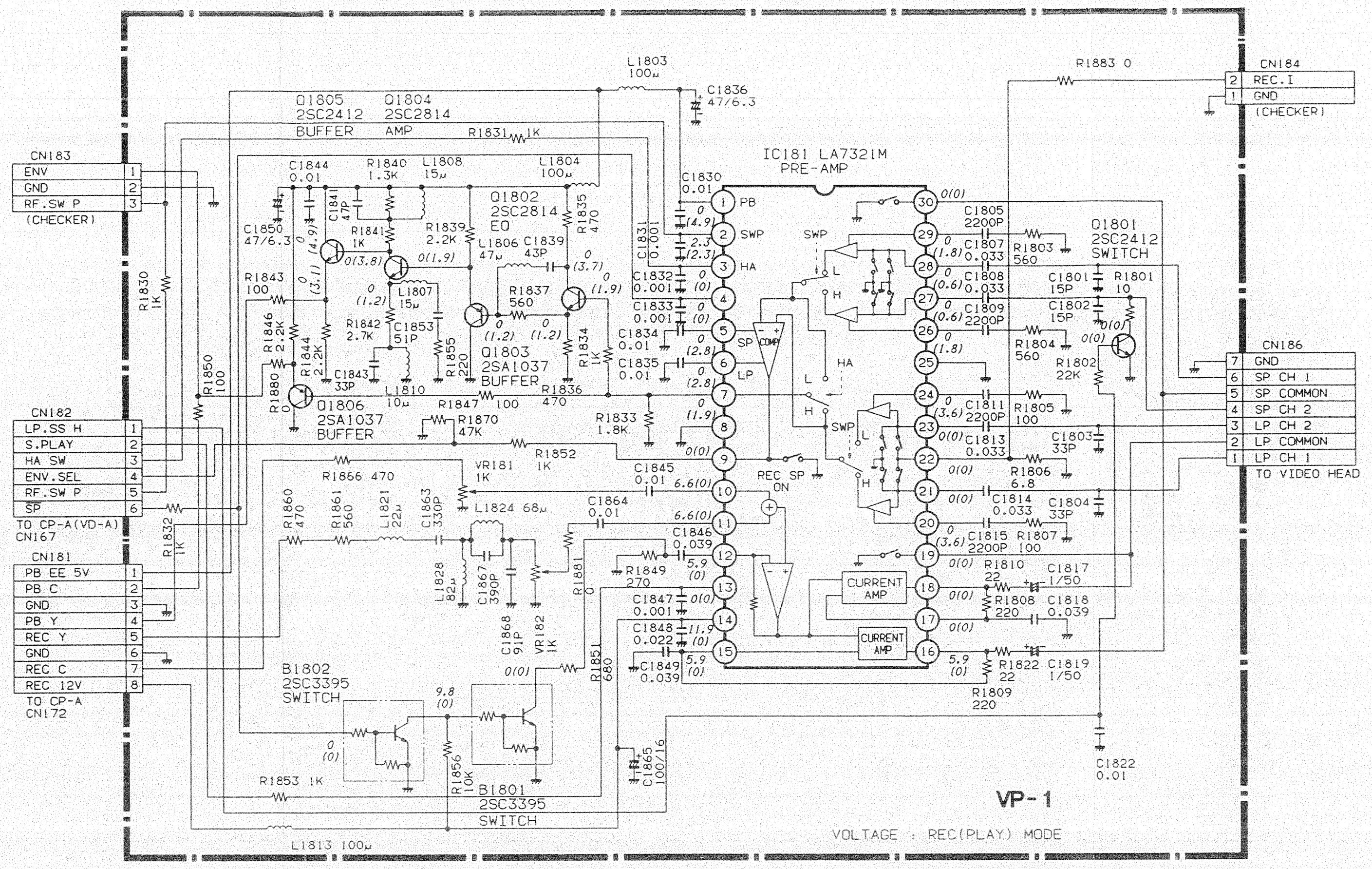

VP-1
1AC4B10A02800C
CN182
CN181

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

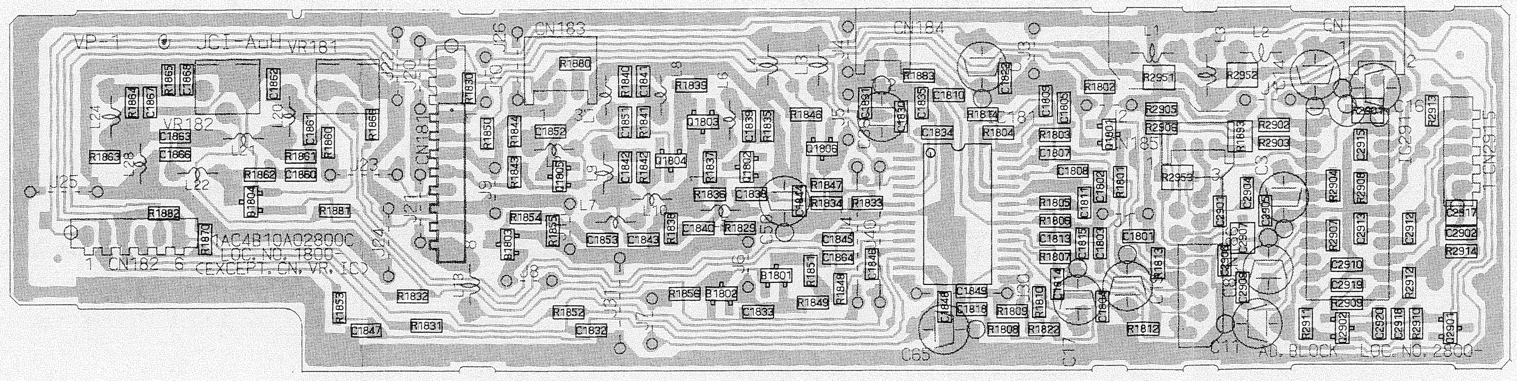




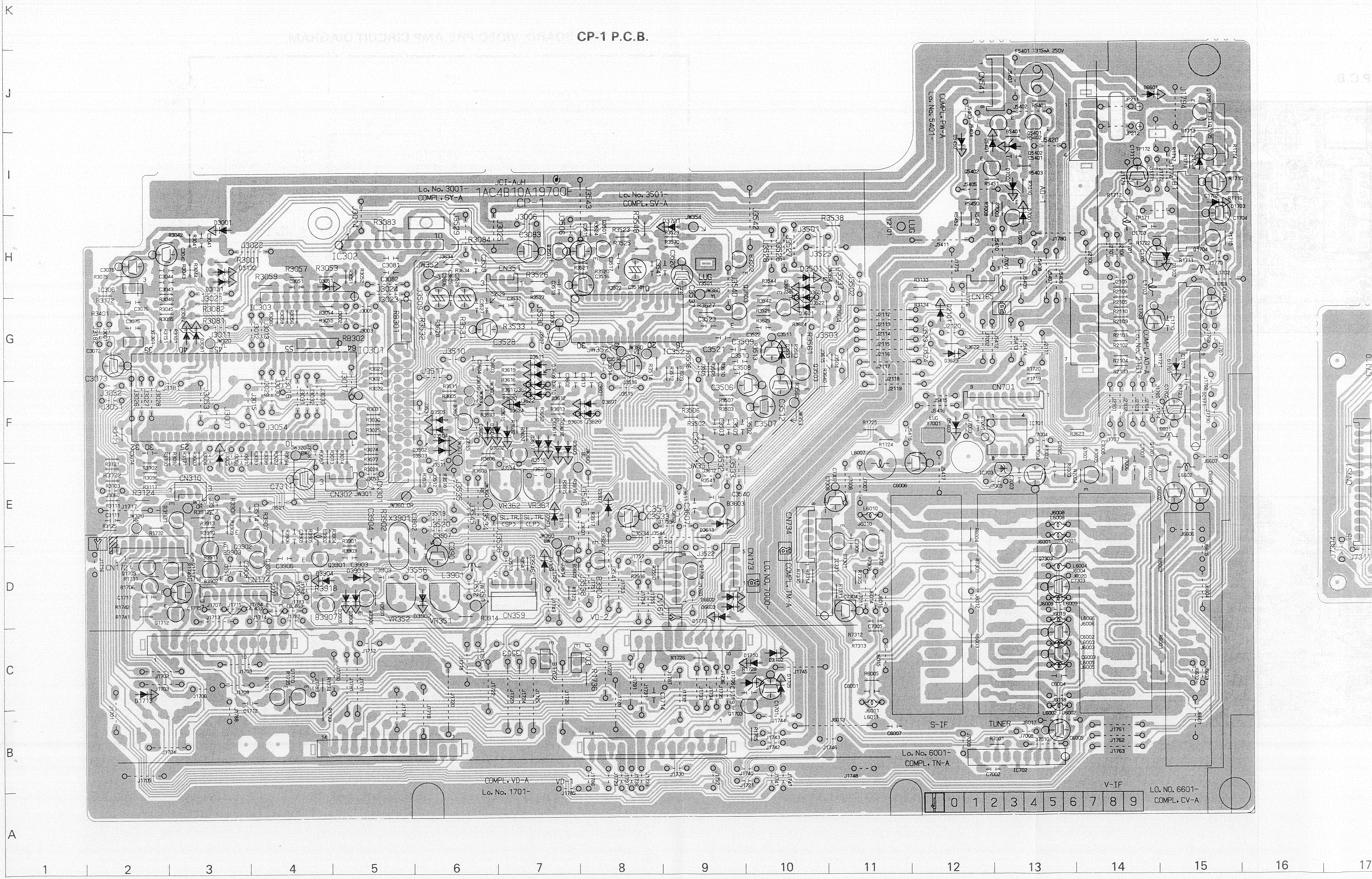
VP-1 BOARD VIDEO PRE-AMP CIRCUIT DIAGRAM


CN183
ENV
GND
RF.SW P
(CHECKER)
CN182
LP.SS H
S.PLAY
HA SW
ENV.SEL
RF.SW P
SP
TO CP-A(VD-A) CN167
CN181
PB EE 5V
PB C
GND
PB Y
REC Y
GND
REC C
REC 12V
TO CP-A CN172
Q1805 2SC2412 BUFFER
Q1804 2SC2814 AMP
Q1802 2SC2814 EQ
Q1803 2SA1037 BUFFER
Q1806 2SA1037 BUFFER
IC181 LA7321M PRE-AMP
Q1801 2SC2412 SWITCH
B1802 2SC3395 SWITCH
B1801 2SC3395 SWITCH
CURRENT AMP
CN184
REC.I
GND
(CHECKER)
CN186
GND
SP CH 1
SP COMMON
SP CH 2
LP CH 2
LP COMMON
LP CH 1
TO VIDEO HEAD
VP-1
VOLTAGE : REC(PLAY) MODE

VP-1 P.C.B.


VP-1
CN183
CN184
CN182
AD BLOCK LOC NO.2900-

CP-1 P.C.B.


K
J
I
H
G
F
E
D
C
B
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9
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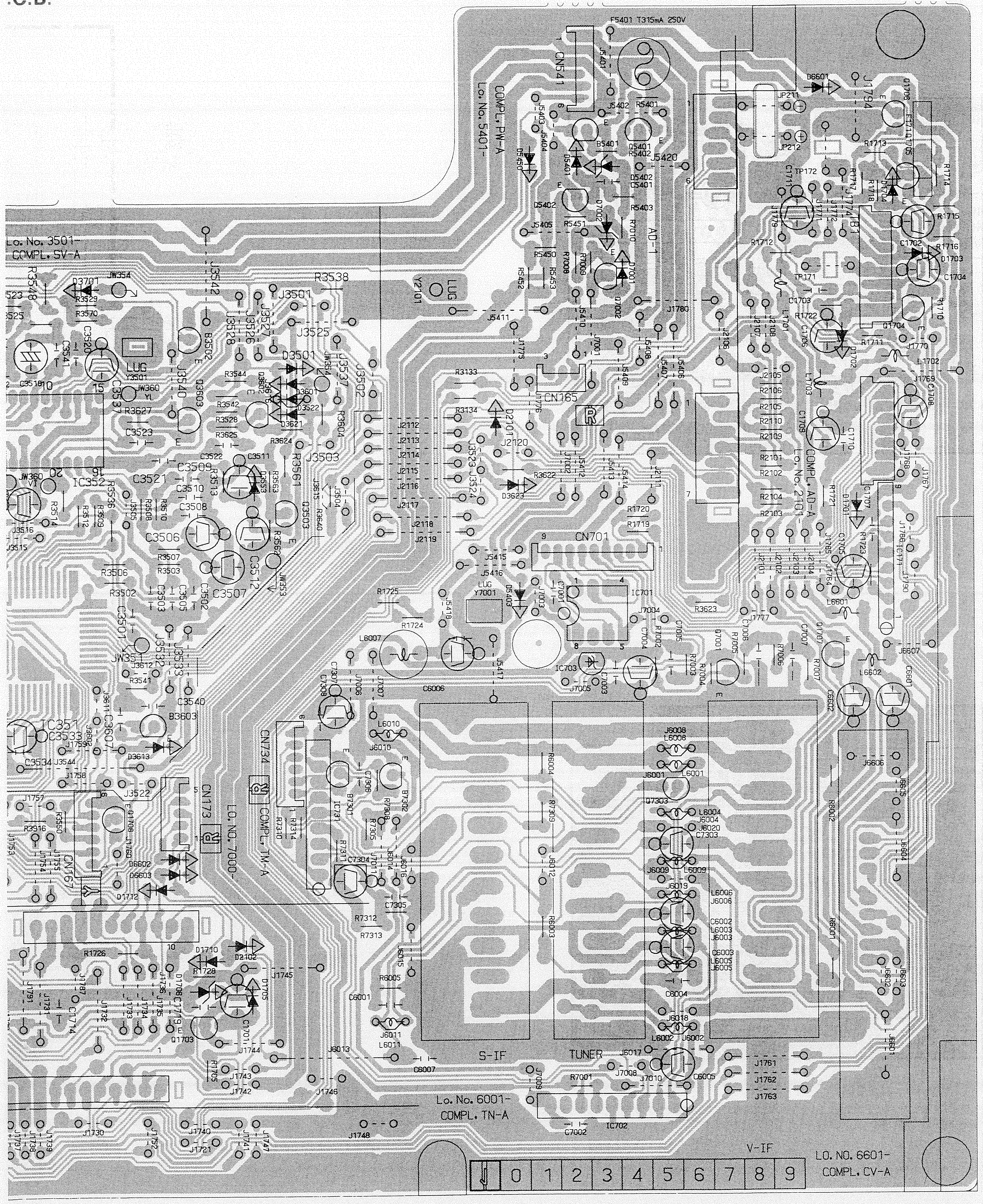
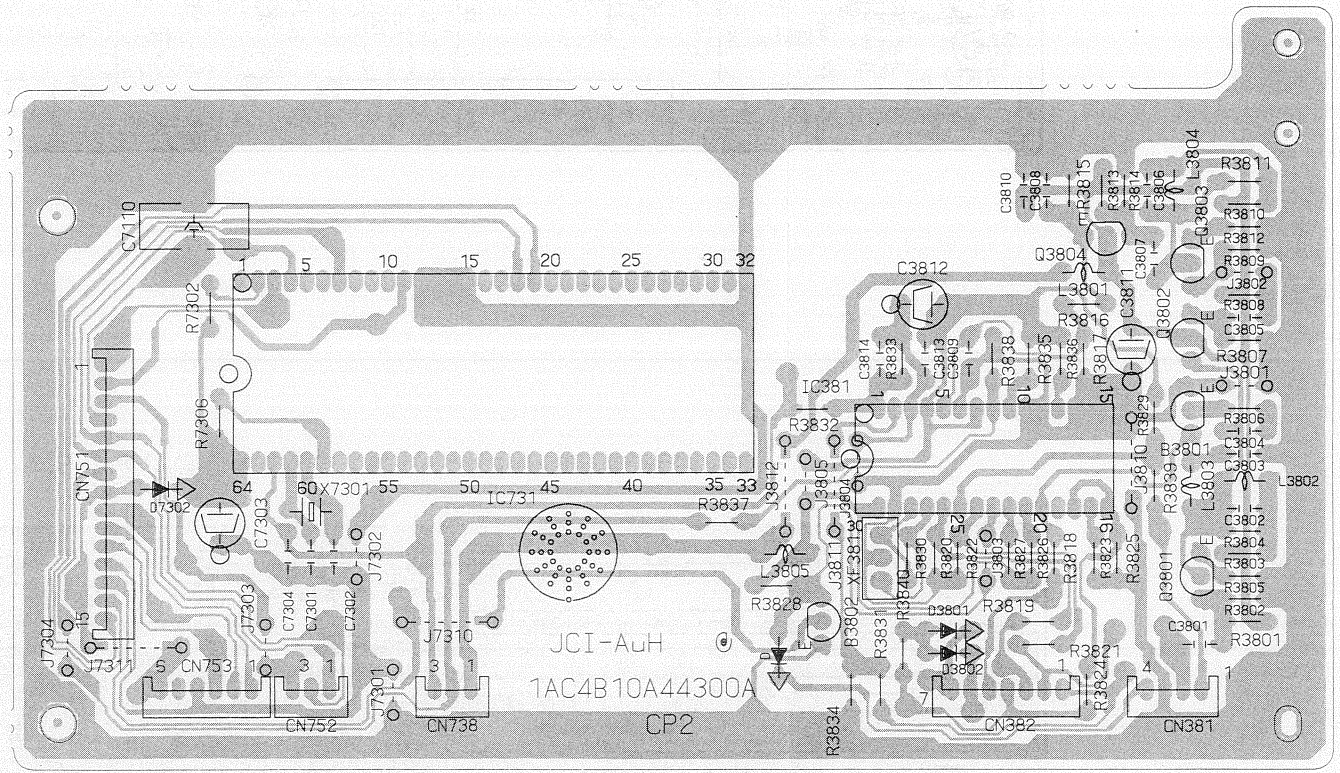
11
12
13
14
15
16
17
JCI-AuH
1AC4B10A19700F
CP-1
Lo. No. 3001-
COMPL. SY-A
Lo. No. 3501-
COMPL. SV-A
Lo. No. 5401-
COMPL. PW-A
F5401 T315mA 250V
AD-1
Lo. No. 2101-
COMPL. AD-A
LO. NO. 7000-
COMPL. TM-A
Lo. No. 6001-
COMPL. TN-A
LO. NO. 6601-
COMPL. CV-A
COMPL. VD-A
Lo. No. 1701-
VD-1
VD-2
S-IF
TUNER
V-IF
0
1
2
3
4
5
6
7
8
9
IC301
IC302
IC303
IC306
IC351
IC352
IC701
IC702
IC703
CN165
CN167
CN172
CN173
CN174
CN302
CN310
CN351
CN359
CN701
CN734
CN751
VR351
VR352
VR361
VR362
X3901
Y7001
Y2101
LUG
SL. TR. (SP)
SL. TR. (LP)

.C.B.

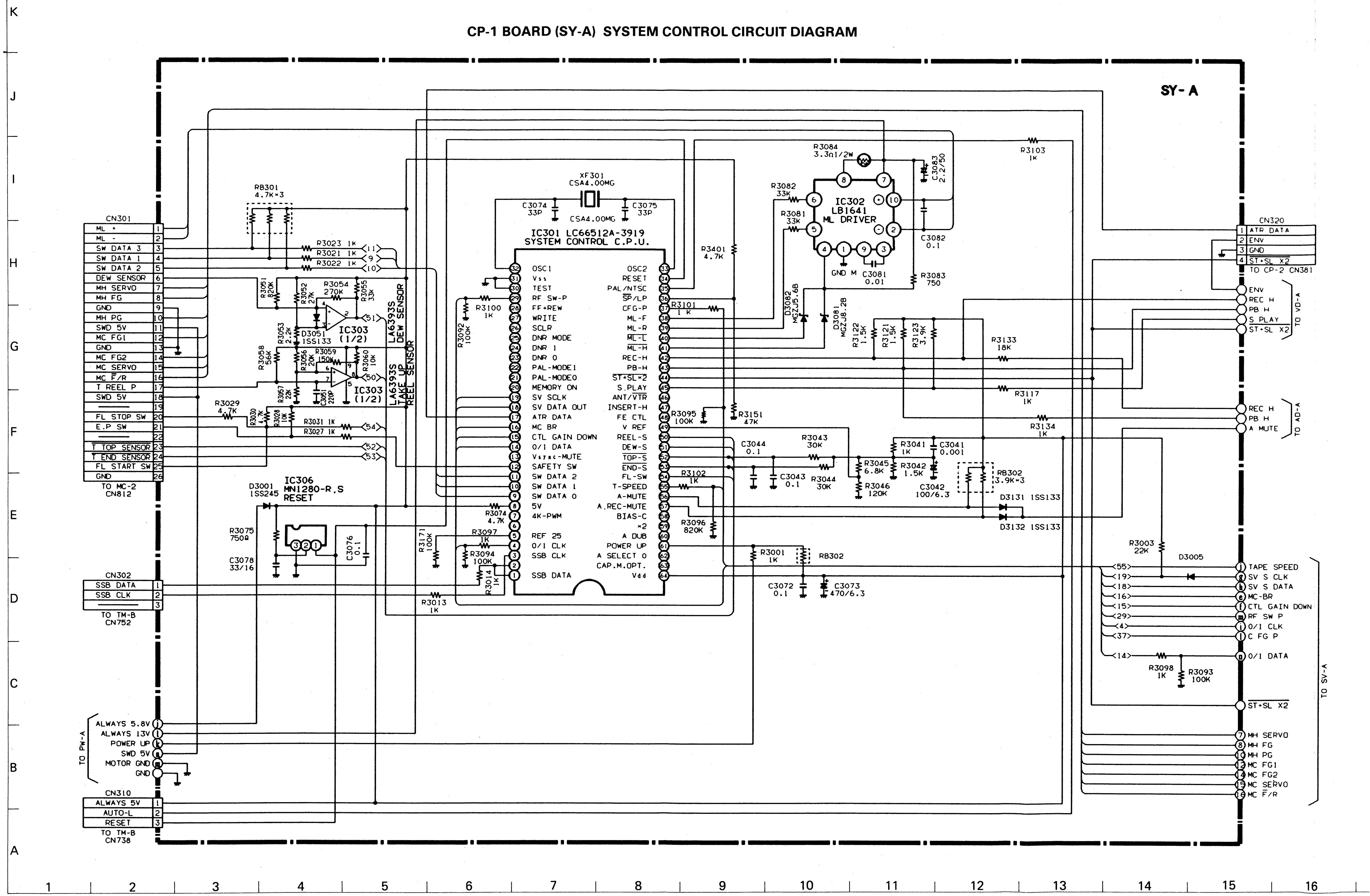

Lo. No. 3501-
COMPL. SV-A
COMPL. PW-A
Lo. No. 5401-
F5401 T315mA 250V
AD-1
COMPL. AD-A
Lo. No. 2101-
CN701
IC701
Y7001
CN734
COMPL. TM-A
LO. NO. 7000-
CN173
S-IF
TUNER
Lo. No. 6001-
COMPL. TN-A
IC702
V-IF
LO. NO. 6601-
COMPL. CV-A
0 1 2 3 4 5 6 7 8 9

CP-2 P.C.B.


IC731
X7301
CN751
CN753
CN752
CN738
IC381
CN382
CN381
JCI-AuH
1AC4B10A44300A
CP2

3 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24

CP-1 BOARD (SY-A) SYSTEM CONTROL CIRCUIT DIAGRAM


SY- A
IC301 LC66512A-3919
SYSTEM CONTROL C.P.U.
XF301
CSA4.00MG
C3074 33P
C3075 33P
OSC1
Vss
TEST
RF SW-P
FF+REW
WRITE
SCLR
DNR MODE
DNR 1
DNR 0
PAL-MODE1
PAL-MODE0
MEMORY ON
SV SCLK
SV DATA OUT
ATR DATA
MC BR
CTL GAIN DOWN
0/1 DATA
Vsync-MUTE
SAFETY SW
SW DATA 2
SW DATA 1
SW DATA 0
5V
4K-PWM
REF 25
0/1 CLK
SSB CLK
SSB DATA
OSC2
RESET
PAL/NTSC
SP/LP
CFG-P
ML-F
ML-R
ML-L
ML-H
REC-H
PB-H
ST+SL×2
S.PLAY
ANT/VTR
INSERT-H
FE CTL
V REF
REEL-S
DEW-S
TOP-S
END-S
FL-SW
T-SPEED
A-MUTE
A.REC-MUTE
BIAS-C
×2
A DUB
POWER UP
A SELECT 0
CAP.M.OPT.
Vdd
IC302
LB1641
ML DRIVER
GND M
R3084 3.3Ω1/2W
C3083 2.2/50
R3082 33K
R3081 33K
C3082 0.1
C3081 0.01
R3083 750
D3082 MGZJ5.6B
D3081 MGZJ8.2B
R3401 4.7K
R3101 1K
R3103 1K
R3122 1.5K
R3121 1.5K
R3123 3.9K
R3133 18K
R3117 1K
R3134 1K
RB301 4.7K×3
R3023 1K
R3021 1K
R3022 1K
R3051 820K
R3052 27K
R3054 270K
R3055 33K
D3051 1SS133
IC303 (1/2)
R3053 2.2K
R3058 56K
R3056 20K
R3059 150K
R3060 10K
R3057 22K
C3051 220P
LA6393S DEW SENSOR
LA6393S TAKE UP REEL SENSOR
R3029 4.7K
R3030 4.7K
R3028 10K
R3031 1K
R3027 1K
R3100 1K
R3092 100K
R3095 100K
R3151 47K
C3044 0.1
C3043 0.1
R3043 30K
R3044 30K
R3045 6.8K
R3046 120K
R3041 1K
R3042 1.5K
C3041 0.001
C3042 100/6.3
RB302 3.9K×3
D3131 1SS133
D3132 1SS133
R3102 1K
R3096 820K
R3001 1K
RB302
C3072 0.1
C3073 470/6.3
R3003 22K
D3005
R3098 1K
R3093 100K
D3001 1SS245
IC306 MN1280-R.S RESET
R3075 750Ω
C3078 33/16
C3076 0.1
R3171 100K
R3074 4.7K
R3097 1K
R3094 100K
R3014 1K
R3013 1K
CN301
ML +
ML -
SW DATA 3
SW DATA 1
SW DATA 2
DEW SENSOR
MH SERVO
MH FG
GND
MH PG
SWD 5V
MC FG1
GND
MC FG2
MC SERVO
MC F/R
T REEL P
SWD 5V
FL STOP SW
E.P SW
T TOP SENSOR
T END SENSOR
FL START SW
GND
TO MC-2 CN812
CN302
SSB DATA
SSB CLK
TO TM-B CN752
ALWAYS 5.8V
ALWAYS 13V
POWER UP
SWD 5V
MOTOR GND
GND
TO PW-A
CN310
ALWAYS 5V
AUTO-L
RESET
TO TM-B CN738
CN320
ATR DATA
ENV
GND
ST+SL X2
TO CP-2 CN381
ENV
REC H
PB H
S PLAY
ST+SL X2
TO VD-A
REC H
PB H
A MUTE
TO AD-A
TAPE SPEED
SV S CLK
SV S DATA
MC-BR
CTL GAIN DOWN
RF SW P
0/1 CLK
C FG P
0/1 DATA
ST+SL X2
MH SERVO
MH FG
MH PG
MC FG1
MC FG2
MC SERVO
MC F/R
TO SV-A
K
J
I
H
G
F
E
D
C
B
A
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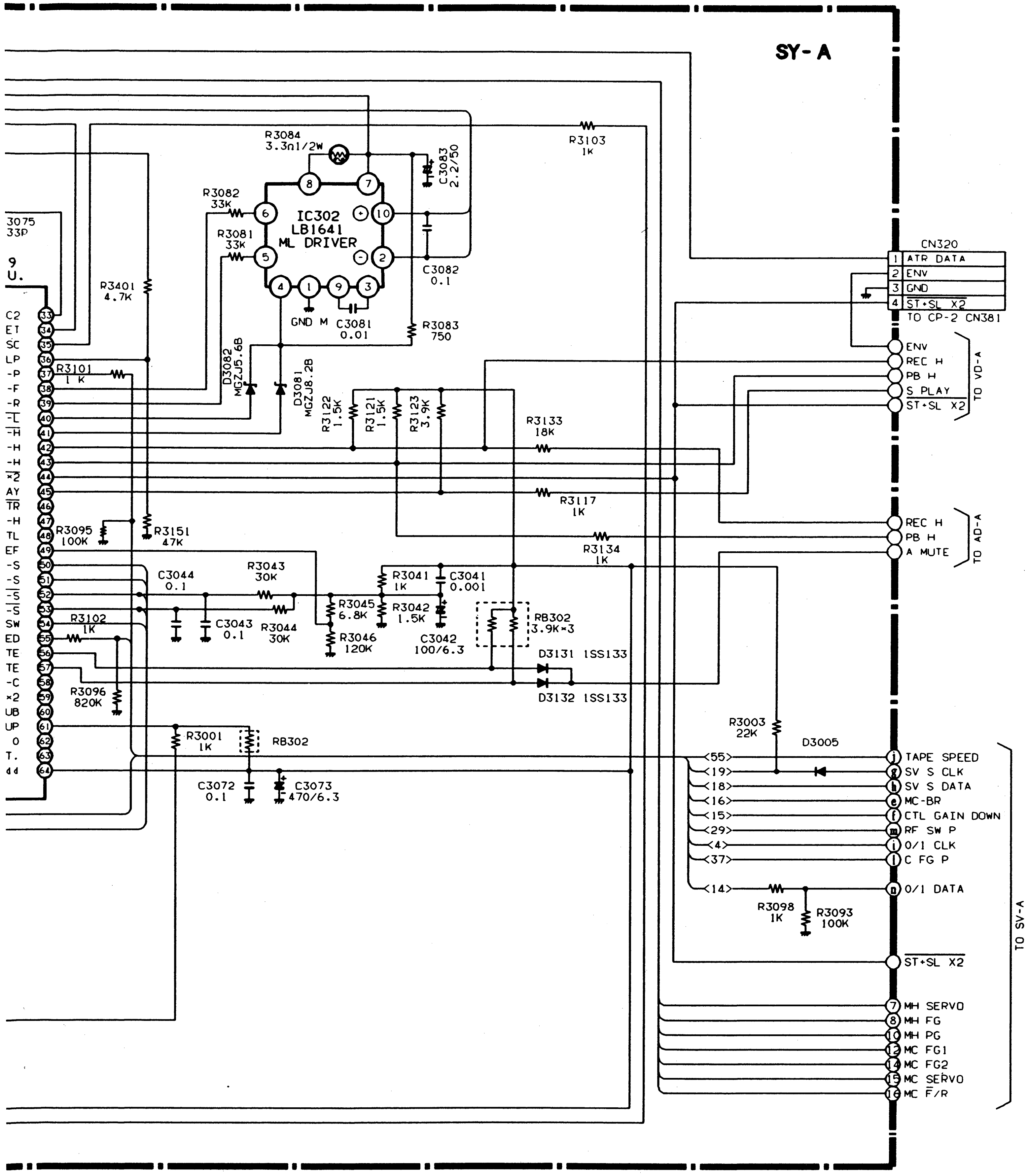
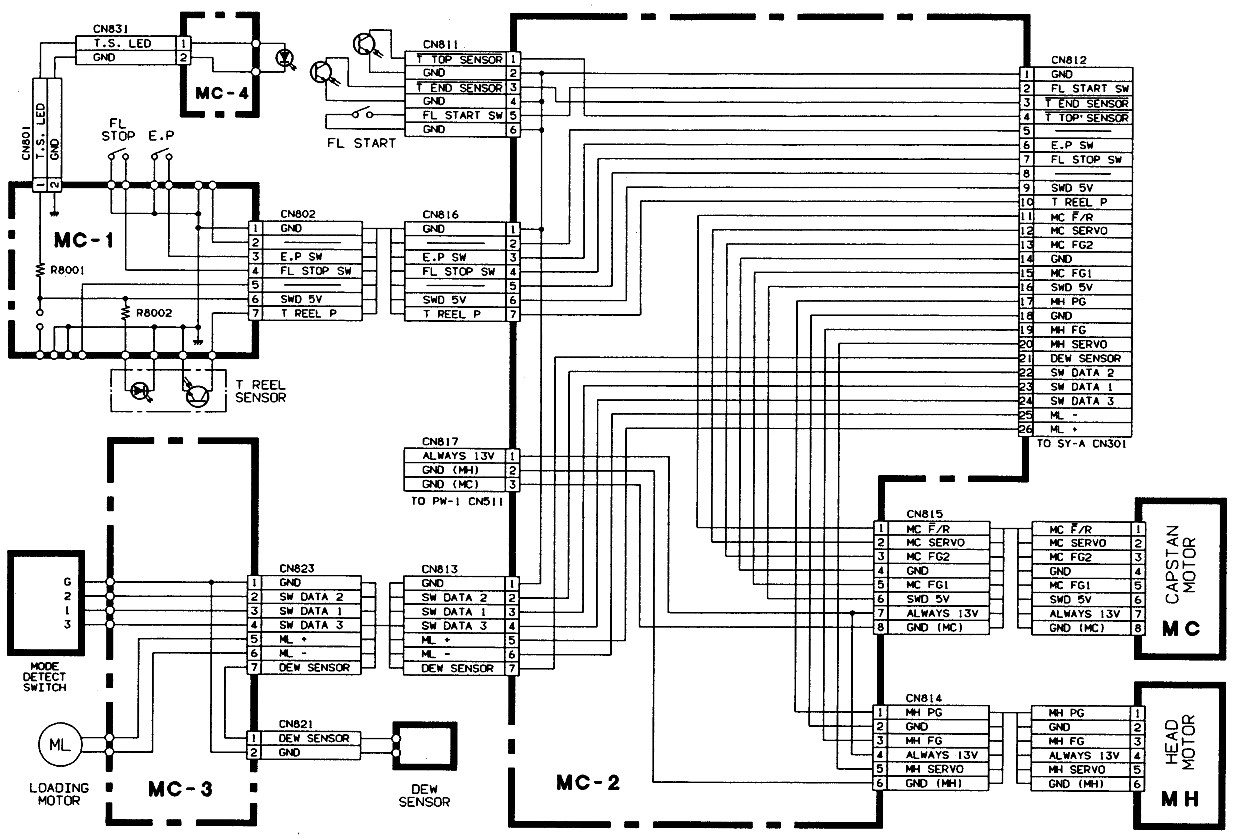
16

EM CONTROL CIRCUIT DIAGRAM

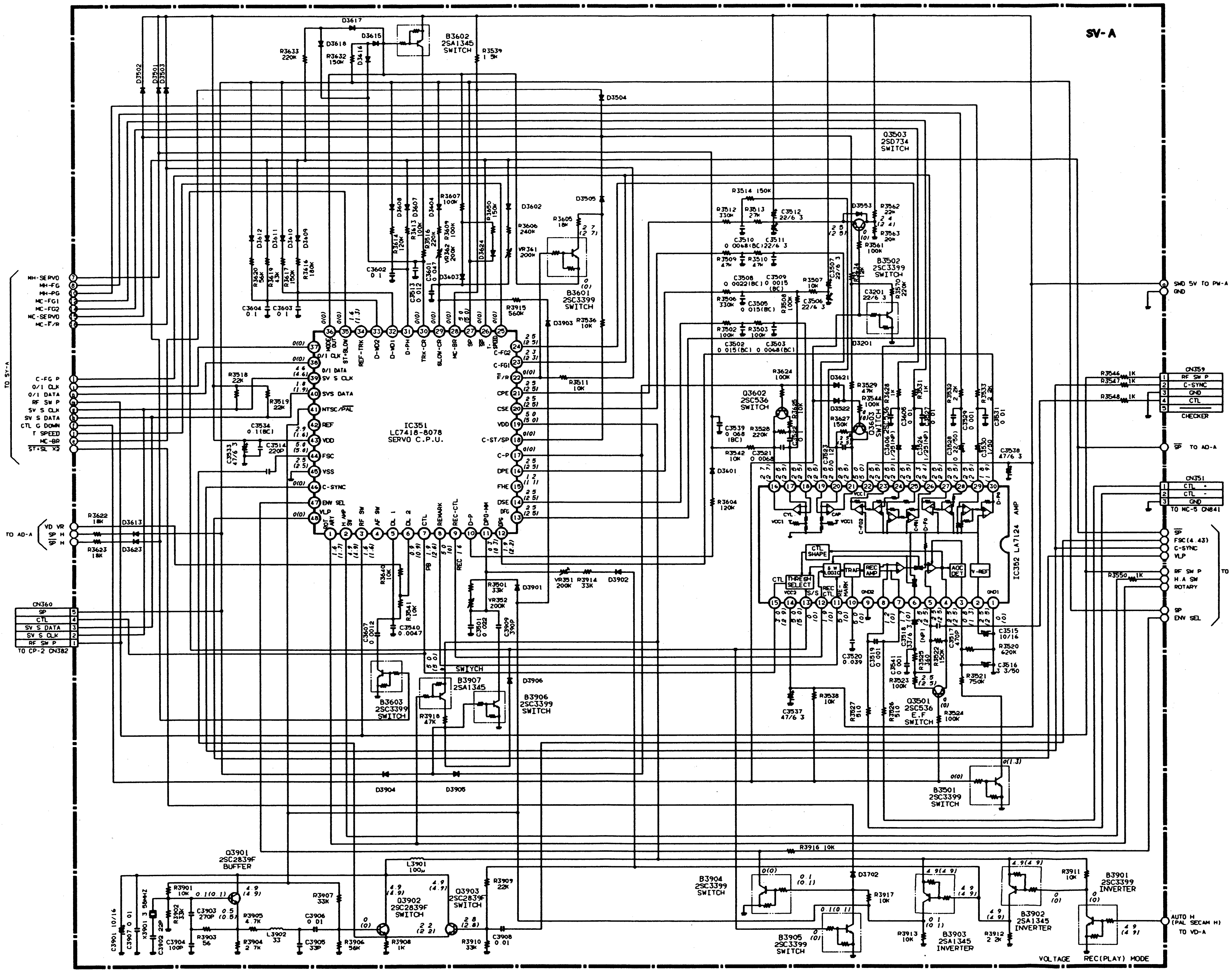

SY- A
R3084
3.3n1/2W
C3083
2.2/50
R3103
1K
R3082
33K
R3081
33K
IC302
LB1641
ML DRIVER
C3082
0.1
GND M
C3081
0.01
R3083
750
3075
33P
R3401
4.7K
D3082
MGZJ5.6B
D3081
MGZJ8.2B
R3122
1.5K
R3121
1.5K
R3123
3.9K
R3133
18K
R3101
1K
R3117
1K
R3095
100K
R3151
47K
R3134
1K
C3044
0.1
R3043
30K
R3041
1K
C3041
0.001
R3045
6.8K
R3042
1.5K
RB302
3.9K×3
C3043
0.1
R3044
30K
R3046
120K
C3042
100/6.3
D3131 1SS133
D3132 1SS133
R3102
1K
R3096
820K
R3003
22K
D3005
R3001
1K
RB302
C3072
0.1
C3073
470/6.3
R3098
1K
R3093
100K
CN320
1 ATR DATA
2 ENV
3 GND
4 ST•SL X2
TO CP-2 CN381
ENV
REC H
PB H
S PLAY
ST•SL X2
TO VD-A
REC H
PB H
A MUTE
TO AD-A
<55> TAPE SPEED
<19> SV S CLK
<18> SV S DATA
<16> MC-BR
<15> CTL GAIN DOWN
<29> RF SW P
<4> 0/1 CLK
<37> C FG P
<14> 0/1 DATA
ST•SL X2
TO SV-A
7 MH SERVO
8 MH FG
10 MH PG
12 MC FG1
14 MC FG2
15 MC SERVO
16 MC F/R

MECHANISM CONNECTION CIRCUIT


CN831
1 T.S. LED
2 GND
MC-4
CN801
1 T.S. LED
2 GND
FL STOP
E.P
MC-1
R8001
R8002
T REEL SENSOR
CN802
1 GND
2
3 E.P SW
4 FL STOP SW
5
6 SWD 5V
7 T REEL P
CN811
1 T TOP SENSOR
2 GND
3 T END SENSOR
4 GND
5 FL START SW
6 GND
FL START
CN816
1 GND
2
3 E.P SW
4 FL STOP SW
5
6 SWD 5V
7 T REEL P
CN812
1 GND
2 FL START SW
3 T END SENSOR
4 T TOP SENSOR
5
6 E.P SW
7 FL STOP SW
8
9 SWD 5V
10 T REEL P
11 MC F/R
12 MC SERVO
13 MC FG2
14 GND
15 MC FG1
16 SWD 5V
17 MH PG
18 GND
19 MH FG
20 MH SERVO
21 DEW SENSOR
22 SW DATA 2
23 SW DATA 1
24 SW DATA 3
25 ML -
26 ML +
TO SY-A CN301
CN817
1 ALWAYS 13V
2 GND (MH)
3 GND (MC)
TO PW-1 CN511
G
2
1
3
MODE DETECT SWITCH
ML
LOADING MOTOR
MC-3
CN823
1 GND
2 SW DATA 2
3 SW DATA 1
4 SW DATA 3
5 ML +
6 ML -
7 DEW SENSOR
CN821
1 DEW SENSOR
2 GND
DEW SENSOR
CN813
1 GND
2 SW DATA 2
3 SW DATA 1
4 SW DATA 3
5 ML +
6 ML -
7 DEW SENSOR
MC-2
CN815
1 MC F/R
2 MC SERVO
3 MC FG2
4 GND
5 MC FG1
6 SWD 5V
7 ALWAYS 13V
8 GND (MC)
CAPSTAN MOTOR
MC
CN814
1 MH PG
2 GND
3 MH FG
4 ALWAYS 13V
5 MH SERVO
6 GND (MH)
HEAD MOTOR
MH

3 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23

CP-1 BOARD (SV-A) SERVO CIRCUIT DIAGRAM



SV-A
IC351 LC7418-8078 SERVO C.P.U.
IC352 LA7124 AMP
Q3503 2SD734 SWITCH
B3602 2SA1345 SWITCH
B3601 2SC3399 SWITCH
B3502 2SC3399 SWITCH
Q3602 2SC536 SWITCH
Q3501 2SC536 E.F SWITCH
B3501 2SC3399 SWITCH
B3603 2SC3399 SWITCH
B3907 2SA1345
B3906 2SC3399 SWITCH
Q3901 2SC2839F BUFFER
Q3902 2SC2839F SWITCH
Q3903 2SC2839F SWITCH
B3904 2SC3399 SWITCH
B3905 2SC3399 SWITCH
B3903 2SA1345 INVERTER
B3902 2SA1345 INVERTER
B3901 2SC3399 INVERTER
L3901 100μ
X3901 3.58MHz
MH-SERVO
MH-FG
MH-PG
MC-FG1
MC-FG2
MC-SERVO
MC-F/R
TO SY-A
C-FG P
0/1 CLK
0/1 DATA
RF SW P
SV S CLK
SV S DATA
CTL G DOWN
T SPEED
MC-BR
ST+SL X2
TO AD-A
VD VR
SP H
CN360
SP
CTL
SV S DATA
SV S CLK
RF SW P
TO CP-2 CN382
MODE OUT
ST-SLOW
REF-TRK
D-MO2
D-MO1
D-PH
TRK-CR
SLOW-CR
MC-BR
SP
T-SPEED
C-FG2
C-FG1
F/R
CPE
CSE
VDD
C-ST/SP
C-P
DPE
FHE
DSE
DFC
0/1 CLK
0/1 DATA
SV S CLK
SVS DATA
NTSC/PAL
REF
VDD
FSC
VSS
C-SYNC
ENV SEL
VLP
RF SW
AF SW
DL 1
DL 2
CTL
REMARK
REC-CTL
D-P
DPO-MM
DPR
PB
REC
SWITCH
CTL SHAPE
THRESH SELECT
S/S
S.W LOGIC
TRAP
REC AMP
AGC DET
V-REF
CYL
CAP
VCC1
VCC2
GND1
GND2
C-MIX
D-FG
C-FG2
REMARK
SWD 5V TO PW-A
GND
CN359
RF SW P
C-SYNC
GND
CTL
CHECKER
SP TO AD-A
CN351
CTL +
CTL -
GND
TO MC-5 CN841
SP
FSC(4.43)
C-SYNC
VLP
RF SW P
H.A SW
ROTARY
TO VD-A
SP
ENV SEL
AUTO H (PAL SECAM H) TO VD-A
VOLTAGE REC(PLAY) MODE
VR361 200K
VR351 200K
VR352 200K
VR362 200K
R3514 150K
R3916 10K
D3504
D3505
D3602
D3613
D3623
D3617
D3618
D3615
D3616
D3901
D3902
D3903
D3904
D3905
D3906
D3702
D3553
D3201
D3621
D3622
D3601
K
J
I
H
G
F
E
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C
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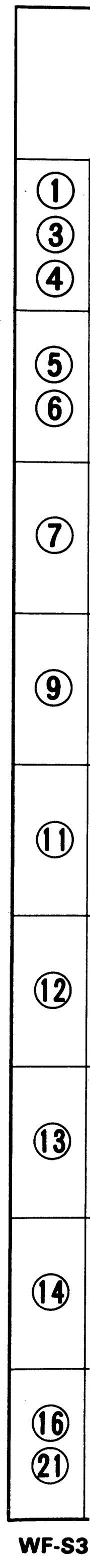

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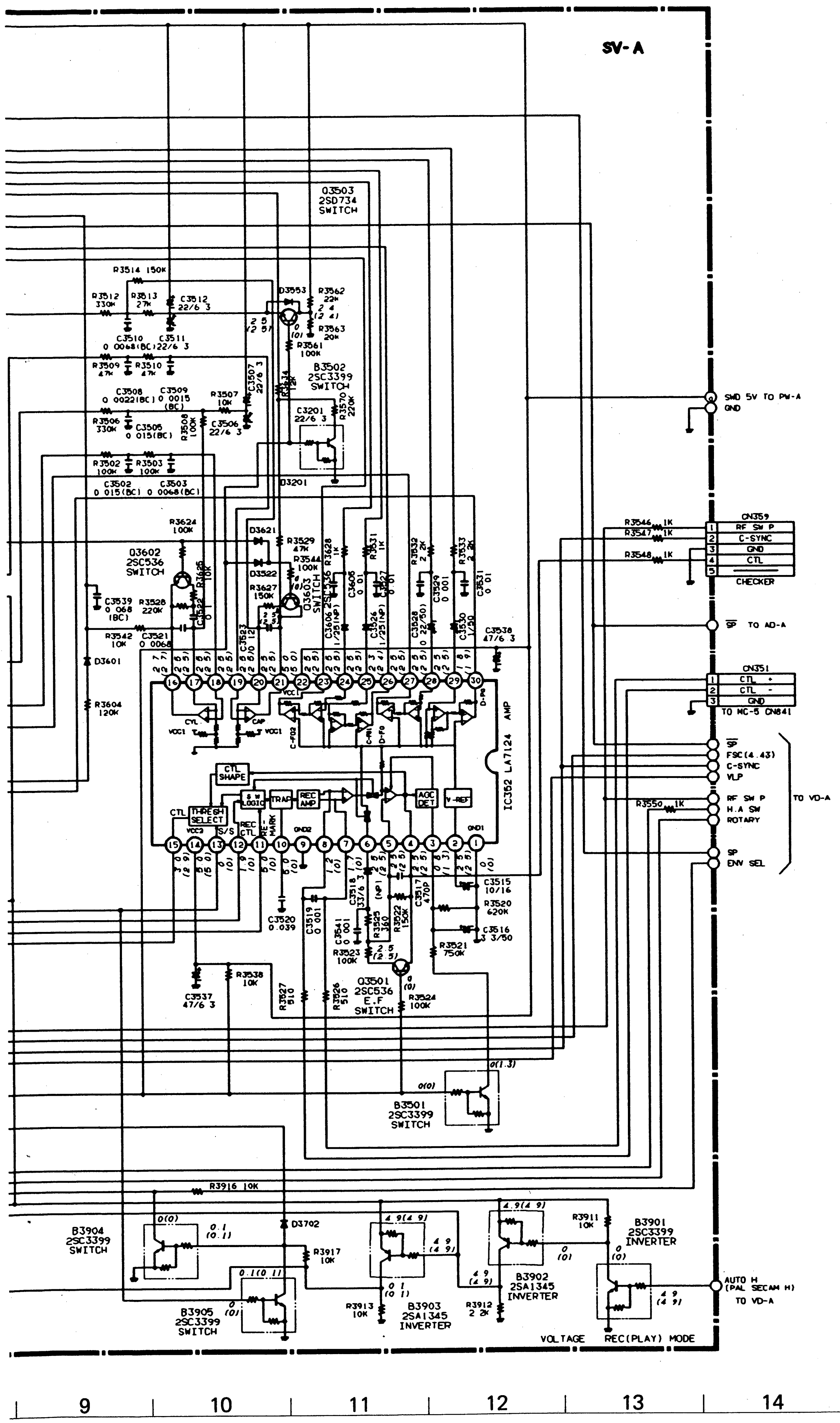
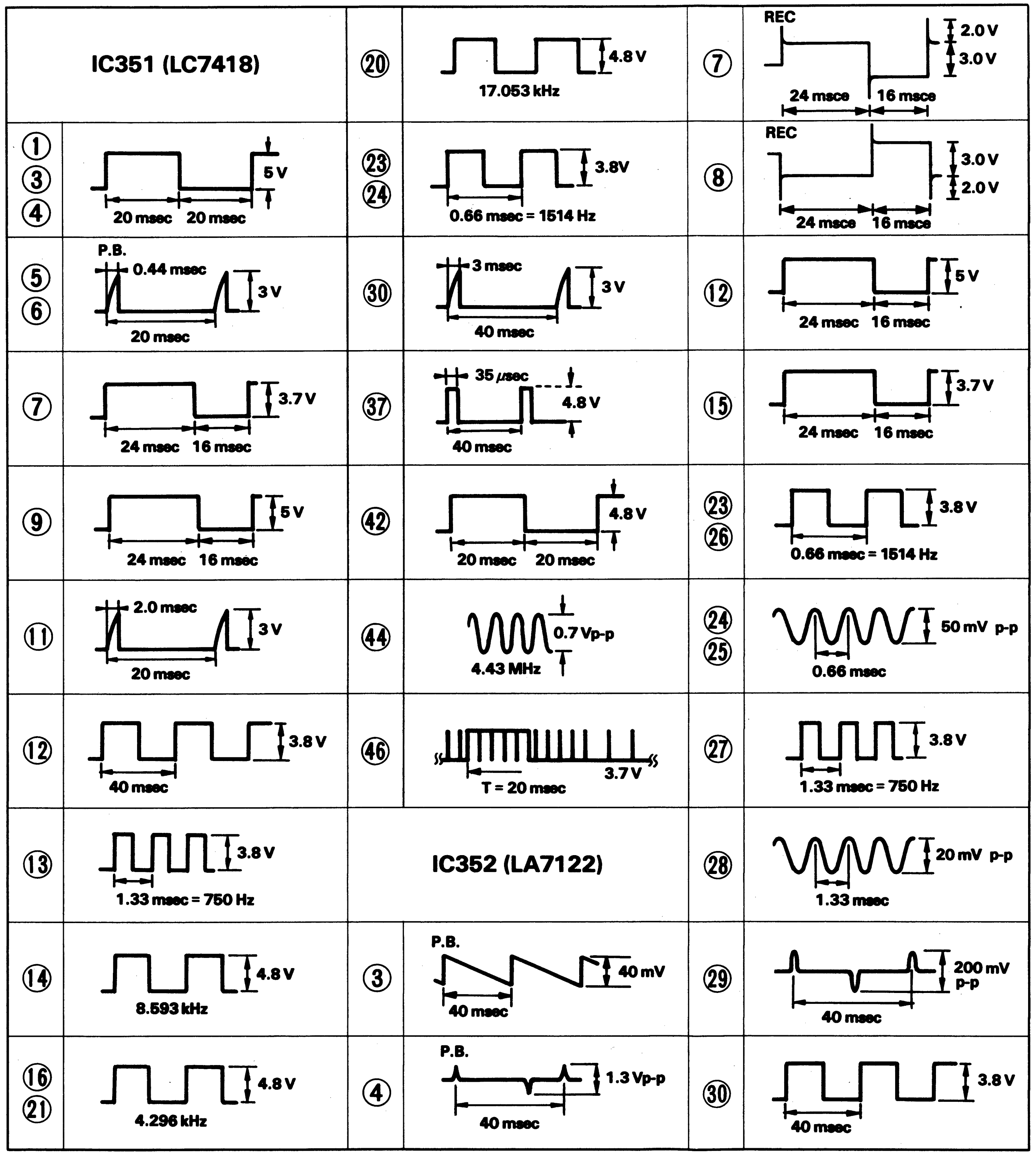
WF-S3

IT DIAGRAM


SV-A
Q3503 2SD734 SWITCH
Q3602 2SC536 SWITCH
Q3603 SWITCH
B3502 2SC3399 SWITCH
Q3501 2SC536 E.F SWITCH
B3501 2SC3399 SWITCH
IC352 LA7124
CTL SHAPE
THRESH SELECT
S/S CTL
REC MARK
S.W. LOGIC
TRAP
REC AMP
AGC DET
V-REF
CYL
CAP
AMP
SWD 5V TO PW-A
GND
CN359
RF SW P
C-SYNC
GND
CTL
CHECKER
SP TO AD-A
CN351
CTL +
CTL -
GND
TO MC-5 CN841
SP
FSC(4.43)
C-SYNC
VLP
RF SW P
H.A SW
ROTARY
SP
ENV SEL
TO VD-A
AUTO H (PAL SECAM H) TO VD-A
B3904 2SC3399 SWITCH
B3905 2SC3399 SWITCH
B3903 2SA1345 INVERTER
B3902 2SA1345 INVERTER
B3901 2SC3399 INVERTER
R3916 10K
D3702
D3401
D3201
VOLTAGE REC(PLAY) MODE
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

WAVEFORM OF SERVO


IC351 (LC7418)
① ③ ④ 5 V 20 msec 20 msec
⑤ ⑥ P.B. 0.44 msec 3 V 20 msec
⑦ 3.7 V 24 msec 16 msec
⑨ 5 V 24 msec 16 msec
⑪ 2.0 msec 3 V 20 msec
⑫ 3.8 V 40 msec
⑬ 3.8 V 1.33 msec = 750 Hz
⑭ 4.8 V 8.593 kHz
⑯ ㉑ 4.8 V 4.296 kHz
⑳ 4.8 V 17.053 kHz
㉓ ㉔ 3.8 V 0.66 msec = 1514 Hz
㉚ 3 msec 3 V 40 msec
㊲ 35 μsec 4.8 V 40 msec
㊷ 4.8 V 20 msec 20 msec
㊹ 0.7 Vp-p 4.43 MHz
㊻ T = 20 msec 3.7 V
IC352 (LA7122)
③ P.B. 40 mV 40 msec
④ P.B. 1.3 Vp-p 40 msec
⑦ REC 2.0 V 3.0 V 24 msce 16 msce
⑧ REC 3.0 V 2.0 V 24 msce 16 msce
⑫ 5 V 24 msec 16 msec
⑮ 3.7 V 24 msec 16 msec
㉓ ㉖ 3.8 V 0.66 msec = 1514 Hz
㉔ ㉕ 50 mV p-p 0.66 msec
㉗ 3.8 V 1.33 msec = 750 Hz
㉘ 20 mV p-p 1.33 msec
㉙ 200 mV p-p 40 msec
㉚ 3.8 V 40 msec

WF-S3

K

J

I

H

G

F

E

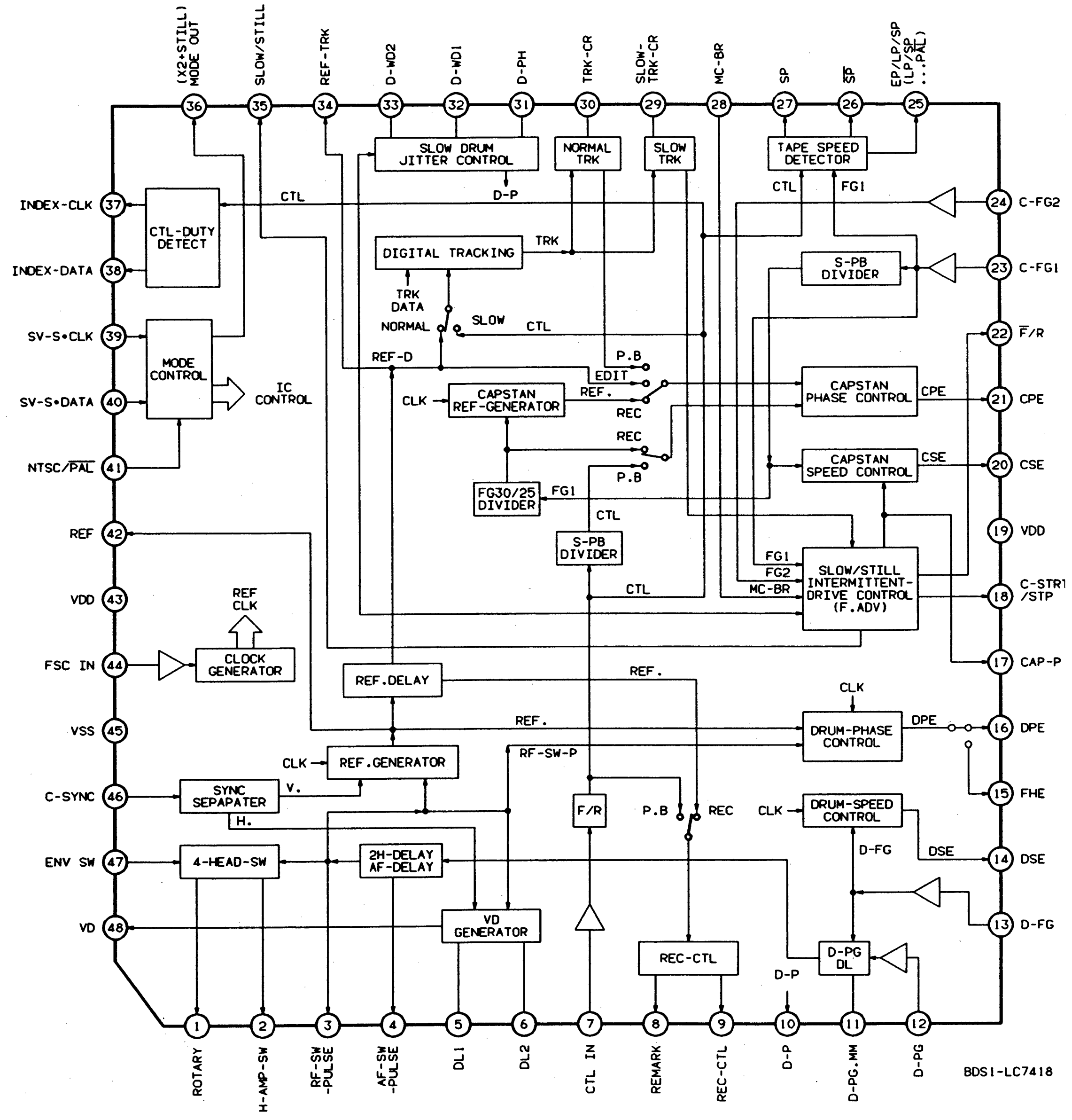
D

C

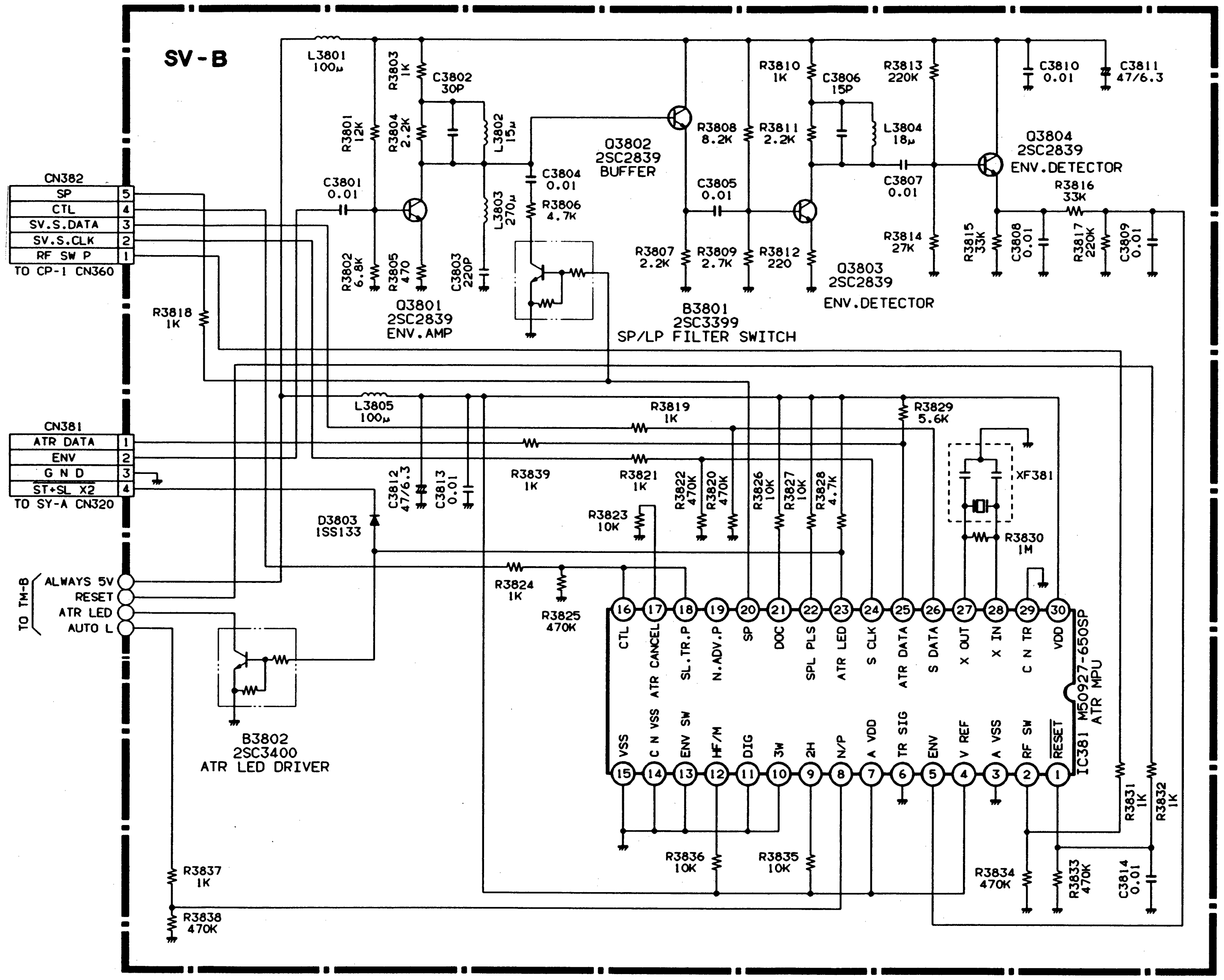
B

A

IC351 (LA7418) DIGITAL SERVO IC INTER BLOCK DIAGRAM

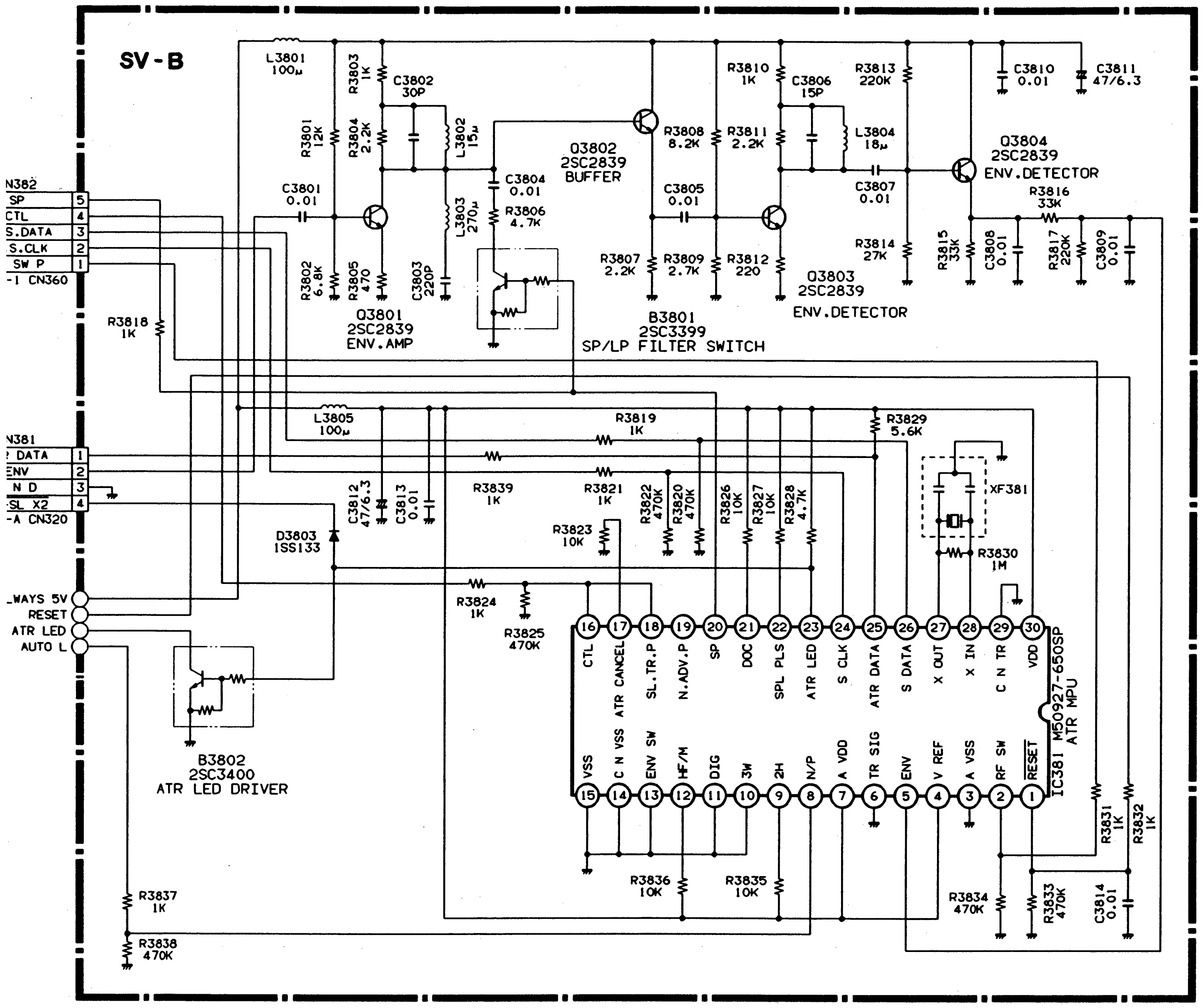

(X2+STILL) MODE OUT
SLOW/STILL
REF-TRK
D-WD2
D-WD1
D-PH
TRK-CR
SLOW-TRK-CR
MC-BR
SP
SP
EP/LP/SP (LP/SP ...PAL)
SLOW DRUM JITTER CONTROL
NORMAL TRK
SLOW TRK
TAPE SPEED DETECTOR
D-P
CTL
FG1
INDEX-CLK
INDEX-DATA
SV-S-CLK
SV-S-DATA
NTSC/PAL
REF
VDD
FSC IN
VSS
C-SYNC
ENV SW
VD
CTL-DUTY DETECT
MODE CONTROL
IC CONTROL
DIGITAL TRACKING
TRK
TRK DATA
NORMAL
SLOW
REF-D
S-PB DIVIDER
CLK
CAPSTAN REF-GENERATOR
REF.
EDIT
P.B
REC
CAPSTAN PHASE CONTROL
CAPSTAN SPEED CONTROL
FG30/25 DIVIDER
FG1
S-PB DIVIDER
SLOW/STILL INTERMITTENT-DRIVE CONTROL (F.ADV)
FG2
MC-BR
REF CLK
CLOCK GENERATOR
REF.DELAY
REF. GENERATOR
SYNC SEPAPATER
V.
H.
RF-SW-P
F/R
DRUM-PHASE CONTROL
DRUM-SPEED CONTROL
D-FG
DSE
DPE
CPE
CSE
4-HEAD-SW
2H-DELAY AF-DELAY
VD GENERATOR
REC-CTL
D-PG DL
C-FG2
C-FG1
F/R
CPE
CSE
VDD
C-STR1 /STP
CAP-P
DPE
FHE
DSE
D-FG
ROTARY
H-AMP-SW
RF-SW -PULSE
AF-SW -PULSE
DL1
DL2
CTL IN
REMARK
REC-CTL
D-P
D-PG.MM
D-PG
BDS1-LC7418

CP-2 BOARD (SV-B) AUTO TRACKING CIRCUIT DIAGRAM

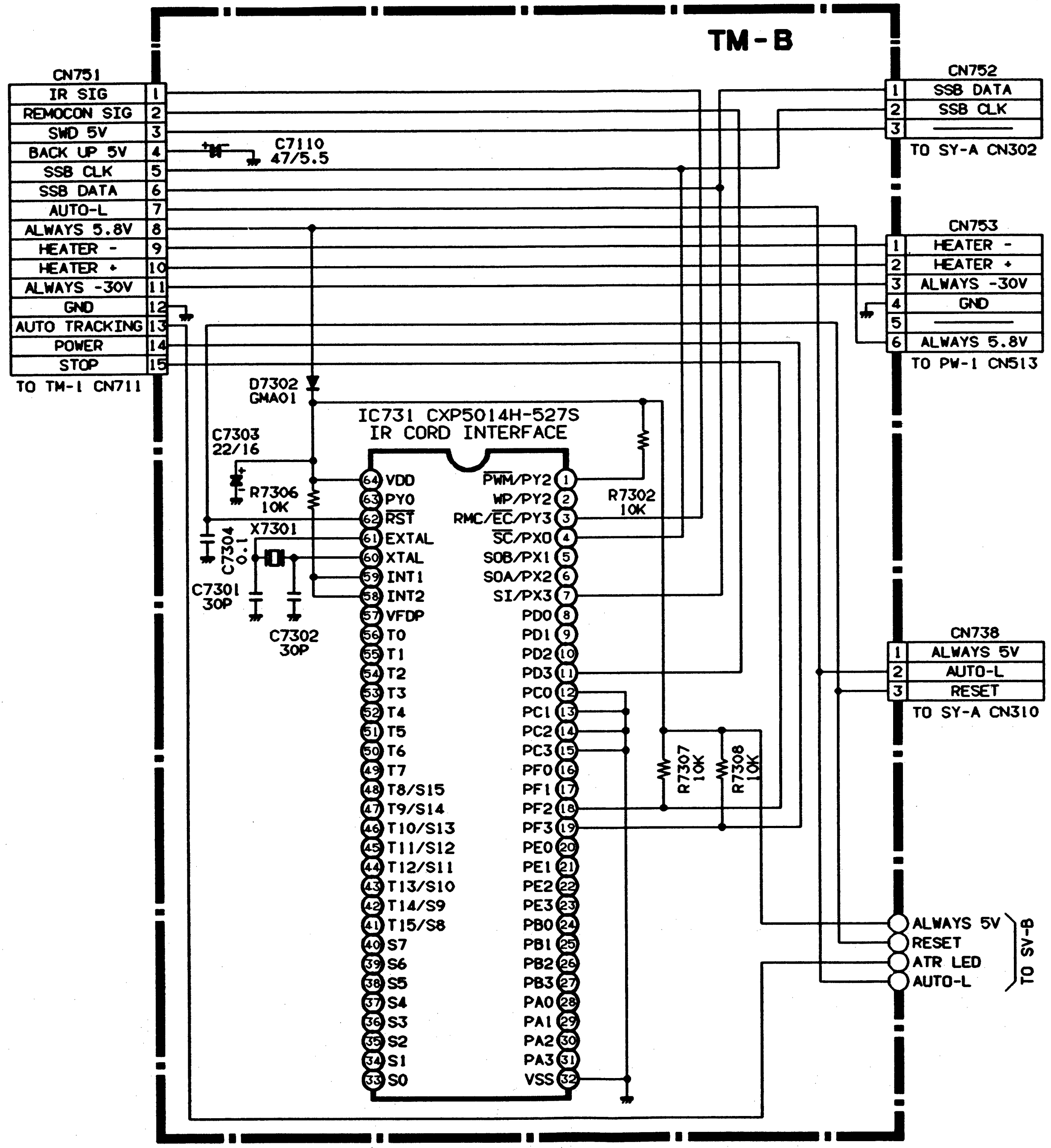

SV-B
CN382
SP
CTL
SV.S.DATA
SV.S.CLK
RF SW P
TO CP-1 CN360
CN381
ATR DATA
ENV
GND
ST+SL X2
TO SY-A CN320
TO TM-B
ALWAYS 5V
RESET
ATR LED
AUTO L
L3801 100μ
R3803 1K
C3802 30P
R3801 12K
R3804 2.2K
L3802 15μ
C3801 0.01
R3802 6.8K
R3805 470
C3803 220P
L3803 270μ
C3804 0.01
R3806 4.7K
Q3801 2SC2839 ENV.AMP
Q3802 2SC2839 BUFFER
B3801 2SC3399 SP/LP FILTER SWITCH
R3808 8.2K
R3811 2.2K
R3810 1K
C3806 15P
L3804 18μ
C3805 0.01
C3807 0.01
R3807 2.2K
R3809 2.7K
R3812 220
Q3803 2SC2839 ENV.DETECTOR
R3813 220K
R3814 27K
Q3804 2SC2839 ENV.DETECTOR
C3810 0.01
C3811 47/6.3
R3816 33K
R3815 33K
C3808 0.01
R3817 220K
C3809 0.01
R3818 1K
L3805 100μ
R3819 1K
R3829 5.6K
C3812 47/6.3
C3813 0.01
R3839 1K
R3821 1K
R3822 470K
R3820 470K
R3826 10K
R3827 10K
R3828 4.7K
XF381
R3830 1M
D3803 1SS133
R3823 10K
R3824 1K
R3825 470K
B3802 2SC3400 ATR LED DRIVER
CTL
ATR CANCEL
SL.TR.P
N.ADV.P
SP
DOC
SPL PLS
ATR LED
S CLK
ATR DATA
S DATA
X OUT
X IN
C N TR
VDD
VSS
C N VSS
ENV SW
HF/M
DIG
3W
2H
N/P
A VDD
TR SIG
ENV
V REF
A VSS
RF SW
RESET
IC381 M50927-650SP ATR MPU
R3831 1K
R3832 1K
R3836 10K
R3835 10K
R3834 470K
R3833 470K
C3814 0.01
R3837 1K
R3838 470K

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

CP-2 BOARD (SV-B) AUTO TRACKING CIRCUIT DIAGRAM

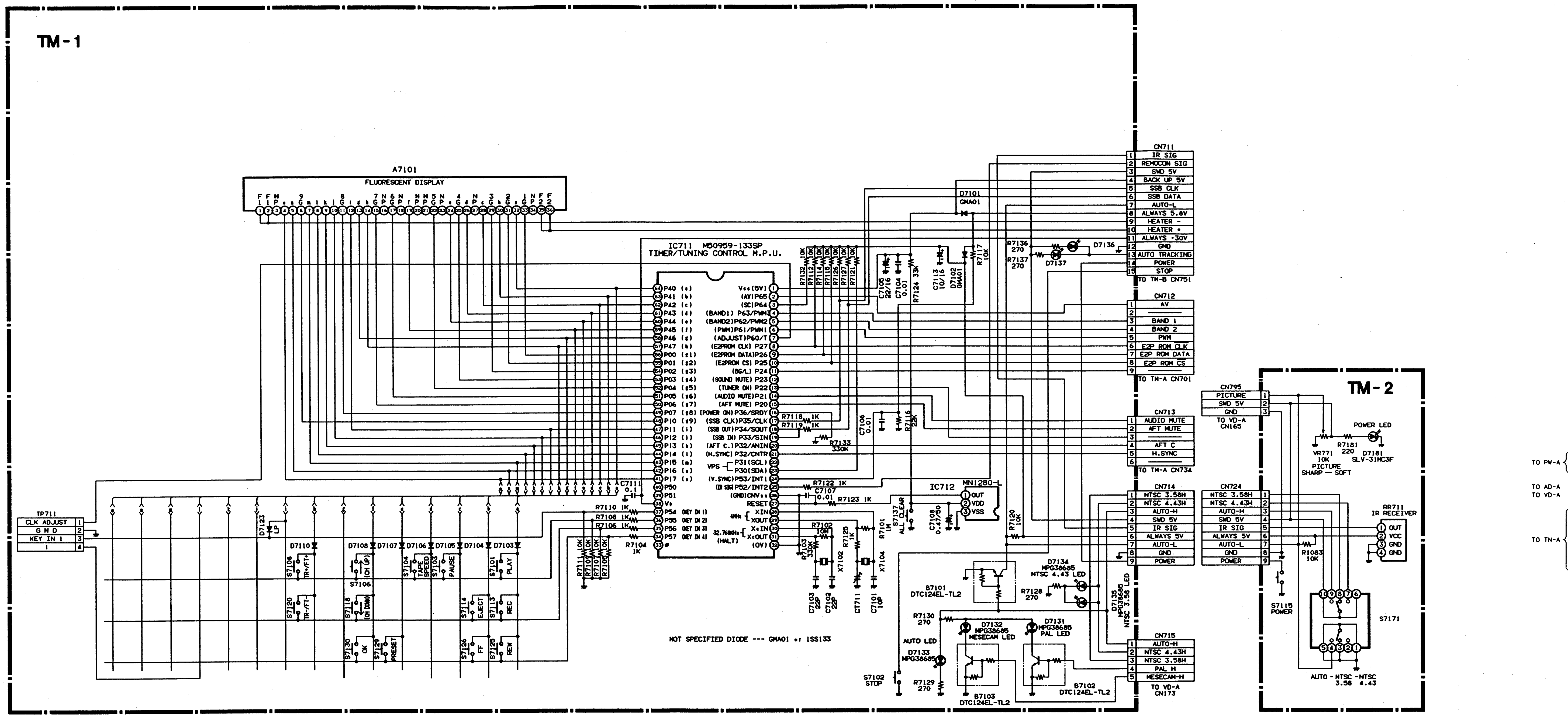

SV-B
N382
SP 5
CTL 4
S.DATA 3
S.CLK 2
SW P 1
-1 CN360
N381
DATA 1
ENV 2
N D 3
SL X2 4
-A CN320
WAYS 5V
RESET
ATR LED
AUTO L
L3801 100μ
R3803 1K
C3802 30P
R3801 12K
R3804 2.2K
L3802 15μ
C3801 0.01
R3802 6.8K
R3805 470
C3803 220P
L3803 270μ
Q3801 2SC2839 ENV.AMP
C3804 0.01
R3806 4.7K
Q3802 2SC2839 BUFFER
B3801 2SC3399 SP/LP FILTER SWITCH
R3808 8.2K
R3811 2.2K
R3810 1K
C3806 15P
R3813 220K
L3804 18μ
C3805 0.01
C3807 0.01
R3807 2.2K
R3809 2.7K
R3812 220
Q3803 2SC2839 ENV.DETECTOR
R3814 27K
Q3804 2SC2839 ENV.DETECTOR
C3810 0.01
C3811 47/6.3
R3816 33K
R3815 33K
C3808 0.01
R3817 220K
C3809 0.01
R3818 1K
L3805 100μ
R3819 1K
R3829 5.6K
XF381
R3830 1M
C3812 47/6.3
C3813 0.01
R3839 1K
R3821 1K
R3822 470K
R3820 470K
R3826 10K
R3827 10K
R3828 4.7K
R3823 10K
D3803 1SS133
R3824 1K
R3825 470K
CTL
ATR CANCEL
SL.TR.P
N.ADV.P
SP
DOC
SPL PLS
ATR LED
S CLK
ATR DATA
S DATA
X OUT
X IN
C N TR
VDD
VSS
C N VSS
ENV SW
HF/M
DIG
3W
2H
N/P
A VDD
TR SIG
ENV
V REF
A VSS
RF SW
RESET
IC381 M50927-650SP ATR MPU
B3802 2SC3400 ATR LED DRIVER
R3831 1K
R3832 1K
R3836 10K
R3835 10K
R3834 470K
R3833 470K
C3814 0.01
R3837 1K
R3838 470K

CP-2 BOARD (TM-B) IR CORD INTERFACE CIRCUIT DIAGRAM


TM-B
CN751
IR SIG 1
REMOCON SIG 2
SWD 5V 3
BACK UP 5V 4
SSB CLK 5
SSB DATA 6
AUTO-L 7
ALWAYS 5.8V 8
HEATER - 9
HEATER + 10
ALWAYS -30V 11
GND 12
AUTO TRACKING 13
POWER 14
STOP 15
TO TM-1 CN711
C7110 47/5.5
D7302 GMA01
C7303 22/16
R7306 10K
C7304 0.1
X7301
C7301 30P
C7302 30P
IC731 CXP5014H-527S IR CORD INTERFACE
VDD 64
PY0 63
RST 62
EXTAL 61
XTAL 60
INT1 59
INT2 58
VFDP 57
TO 56
T1 55
T2 54
T3 53
T4 52
T5 51
T6 50
T7 49
T8/S15 48
T9/S14 47
T10/S13 46
T11/S12 45
T12/S11 44
T13/S10 43
T14/S9 42
T15/S8 41
S7 40
S6 39
S5 38
S4 37
S3 36
S2 35
S1 34
S0 33
PWM/PY2 1
WP/PY2 2
RMC/EC/PY3 3
SC/PX0 4
SOB/PX1 5
SOA/PX2 6
SI/PX3 7
PD0 8
PD1 9
PD2 10
PD3 11
PC0 12
PC1 13
PC2 14
PC3 15
PF0 16
PF1 17
PF2 18
PF3 19
PE0 20
PE1 21
PE2 22
PE3 23
PB0 24
PB1 25
PB2 26
PB3 27
PA0 28
PA1 29
PA2 30
PA3 31
VSS 32
R7302 10K
R7307 10K
R7308 10K
CN752
1 SSB DATA
2 SSB CLK
3
TO SY-A CN302
CN753
1 HEATER -
2 HEATER +
3 ALWAYS -30V
4 GND
5
6 ALWAYS 5.8V
TO PW-1 CN513
CN738
1 ALWAYS 5V
2 AUTO-L
3 RESET
TO SY-A CN310
ALWAYS 5V
RESET
ATR LED
AUTO-L
TO SV-B

8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23

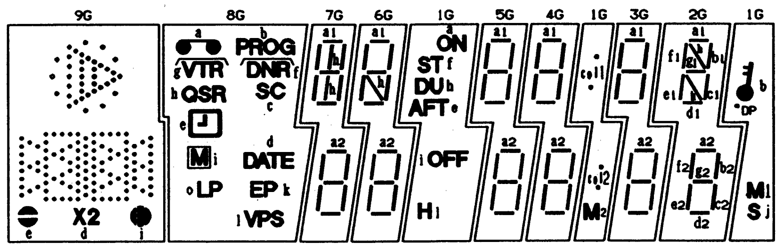
TM-1 BOARD DISPLAY, TIMER TUNING CONTROL CIRCUIT DIAGRAM
TM-2 BOARD SWITCH & VR CIRCUIT DIAGRAM


TM-1
TM-2
A7101
FLUORESCENT DISPLAY
IC711 M50959-133SP
TIMER/TUNING CONTROL M.P.U.
IC712 MN1280-L
OUT
VDD
VSS
CN711
IR SIG
REMOCON SIG
SWD 5V
BACK UP 5V
SSB CLK
SSB DATA
AUTO-L
ALWAYS 5.8V
HEATER -
HEATER +
ALWAYS -30V
GND
AUTO TRACKING
POWER
STOP
TO TM-B CN751
CN712
AV
BAND 1
BAND 2
PWM
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
TO TN-A CN701
CN713
AUDIO MUTE
AFT MUTE
AFT C
H.SYNC
TO TN-A CN734
CN714
NTSC 3.58H
NTSC 4.43H
AUTO-H
SWD 5V
IR SIG
ALWAYS 5V
AUTO-L
GND
POWER
CN715
AUTO-H
NTSC 4.43H
NTSC 3.58H
PAL H
MESECAM-H
TO VD-A CN173
CN795
PICTURE
SWD 5V
GND
TO VD-A CN165
CN724
TP711
CLK ADJUST
GND
KEY IN 1
D7110 D7108 D7107 D7106 D7105 D7104 D7103
S7108 TR+/FT+
S7120 TR-/FT-
S7106 CH UP
S7118 CH DOWN
S7104 TAPE SPEED
S7103 PAUSE
S7101 PLAY
S7114 EJECT
S7113 REC
S7130 OK
S7129 PRESET
S7126 FF
S7125 REW
S7117 ALL CLEAR
S7102 STOP
AUTO LED
D7133 MPG3868S
D7132 MPG3868S MESECAM LED
D7131 MPG3868S PAL LED
D7134 MPG3868S NTSC 4.43 LED
D7135 MPG3868S NTSC 3.58 LED
B7101 DTC124EL-TL2
B7102 DTC124EL-TL2
B7103 DTC124EL-TL2
D7101 GMA01
D7136
D7137
NOT SPECIFIED DIODE --- GMA01 or 1SS133
POWER LED
VR771 10K PICTURE SHARP — SOFT
R7181 220
D7181 SLV-31MC3F
RR711 IR RECEIVER
OUT
VCC
GND
GND
R1063 10K
S7115 POWER
S7171
AUTO - NTSC - NTSC 3.58 4.43
TO PW-A
TO AD-A
TO VD-A
TO TN-A
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

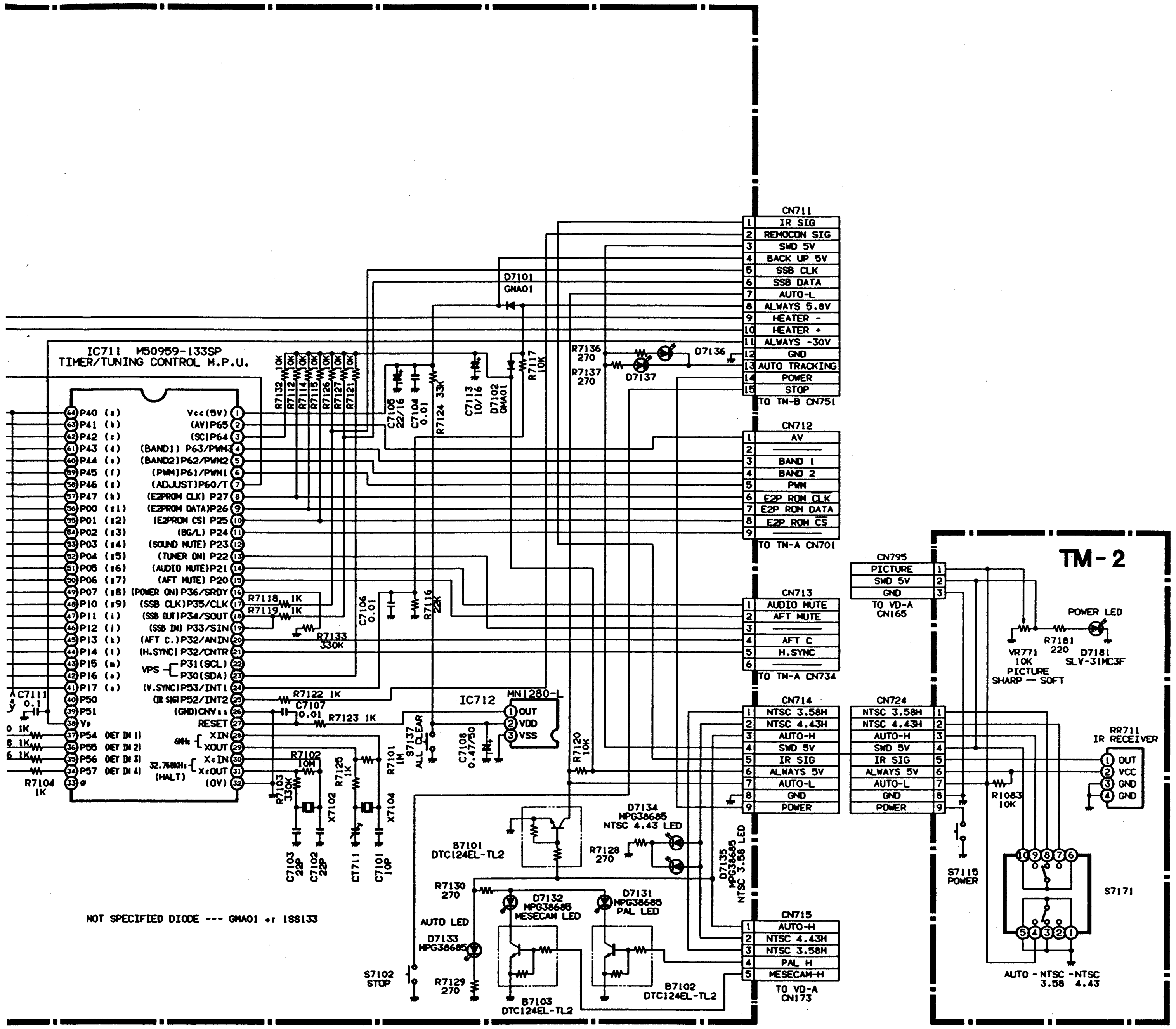
ANODE CONNECTION

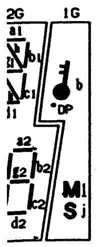
	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	B	●━●	a1	a1	a1	a1	a1	a1	ON
b	A	PROG.	b1	b1	b1	b1	b1	b1	●
c	–	SC	c1	c1	c1	c1	c1	c1	DP
d	×2	DATE	d1	d1	d1	d1	d1	d1	M(1)
e	⊖	▣	e1	e1	e1	e1	e1	e1	AFT
f	C	DNR	f1	f1	f1	f1	f1	f1	ST
g	D	VTR	g1	g1	g1	g1	g1	g1	col*1
h	–	QSR	/	\	–	–	–	\	DU
i	●	[M]	a2	a2	a2	a2	a2	a2	OFF
j	E	–	b2	b2	b2	b2	b2	b2	S
k	I	EP	c2	c2	c2	c2	c2	c2	–
l	H	VPS	d2	d2	d2	d2	d2	d2	H
m	J	–	e2	e2	e2	e2	e2	e2	M(2)
n	F	–	f2	f2	f2	f2	f2	f2	–
o	G	LP	g2	g2	g2	g2	g2	g2	col*2

GRID ASSIGNMENT

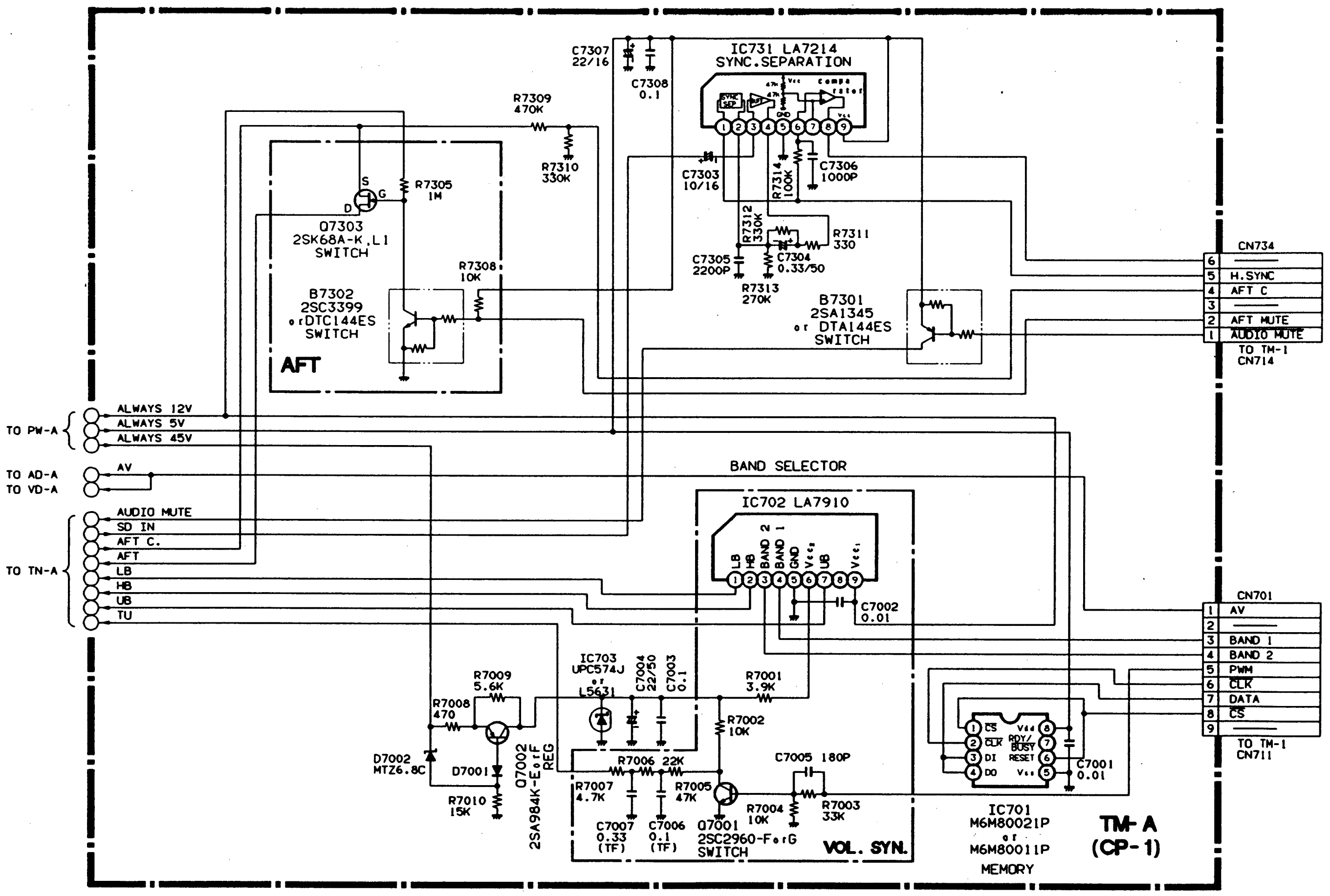

9G
8G
7G
6G
1G
5G
4G
1G
3G
2G
1G
VTR
QSR
PROG
DNR
SC
DATE
EP
LP
VPS
X2
ON
ST
DU
AFT
OFF
H
M
S

ING CONTROL CIRCUIT DIAGRAM
IT DIAGRAM


IC711 M50959-133SP
TIMER/TUNING CONTROL M.P.U.
CN711
IR SIG
REMOCON SIG
SWD 5V
BACK UP 5V
SSB CLK
SSB DATA
AUTO-L
ALWAYS 5.8V
HEATER -
HEATER +
ALWAYS -30V
GND
AUTO TRACKING
POWER
STOP
TO TM-B CN751
CN712
AV
BAND 1
BAND 2
PWM
E2P ROM CLK
E2P ROM DATA
E2P ROM CS
TO TM-A CN701
CN713
AUDIO MUTE
AFT MUTE
AFT C
H.SYNC
TO TM-A CN734
CN714
NTSC 3.58H
NTSC 4.43H
AUTO-H
SWD 5V
IR SIG
ALWAYS 5V
AUTO-L
GND
POWER
CN715
AUTO-H
NTSC 4.43H
NTSC 3.58H
PAL H
MESECAM-H
TO VD-A CN173
D7101 GMA01
D7136
D7137
IC712 MN1280-L
OUT
VDD
VSS
S7137 ALL CLEAR
B7101 DTC124EL-TL2
B7102 DTC124EL-TL2
B7103 DTC124EL-TL2
D7134 MPG38685 NTSC 4.43 LED
D7135 MPG38685 NTSC 3.58 LED
D7132 MPG38685 MESECAM LED
D7131 MPG38685 PAL LED
D7133 MPG38685 AUTO LED
S7102 STOP
NOT SPECIFIED DIODE --- GMA01 or 1SS133
TM-2
CN795
PICTURE
SWD 5V
GND
TO VD-A CN165
POWER LED
VR771 10K PICTURE SHARP — SOFT
R7181 220
D7181 SLV-31MC3F
CN724
NTSC 3.58H
NTSC 4.43H
AUTO-H
SWD 5V
IR SIG
ALWAYS 5V
AUTO-L
GND
POWER
RR711 IR RECEIVER
OUT
VCC
GND
GND
R1083 10K
S7115 POWER
S7171
AUTO - NTSC - NTSC 3.58 4.43

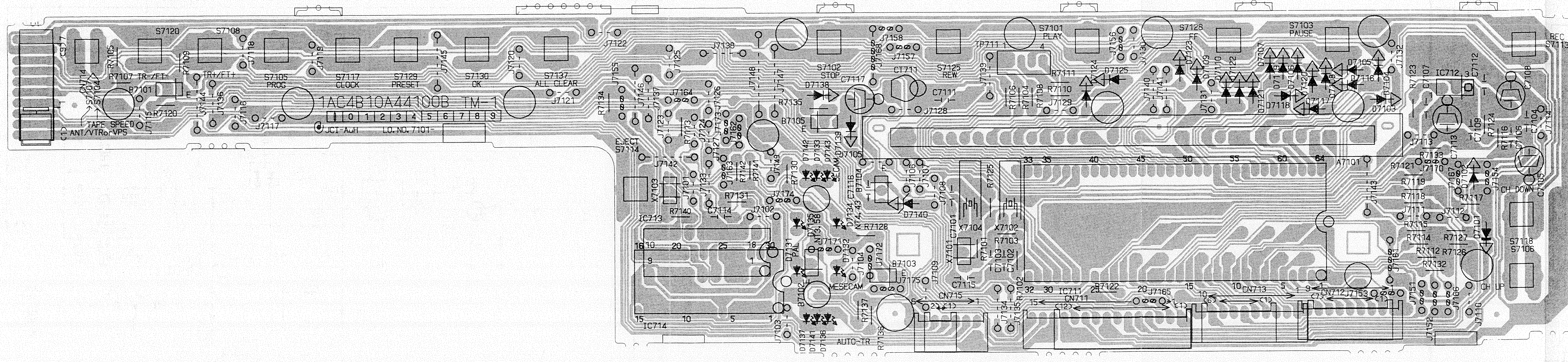


CP-1 BOARD (TM-A) TUNING CONTROL CIRCUIT DIAGRAM

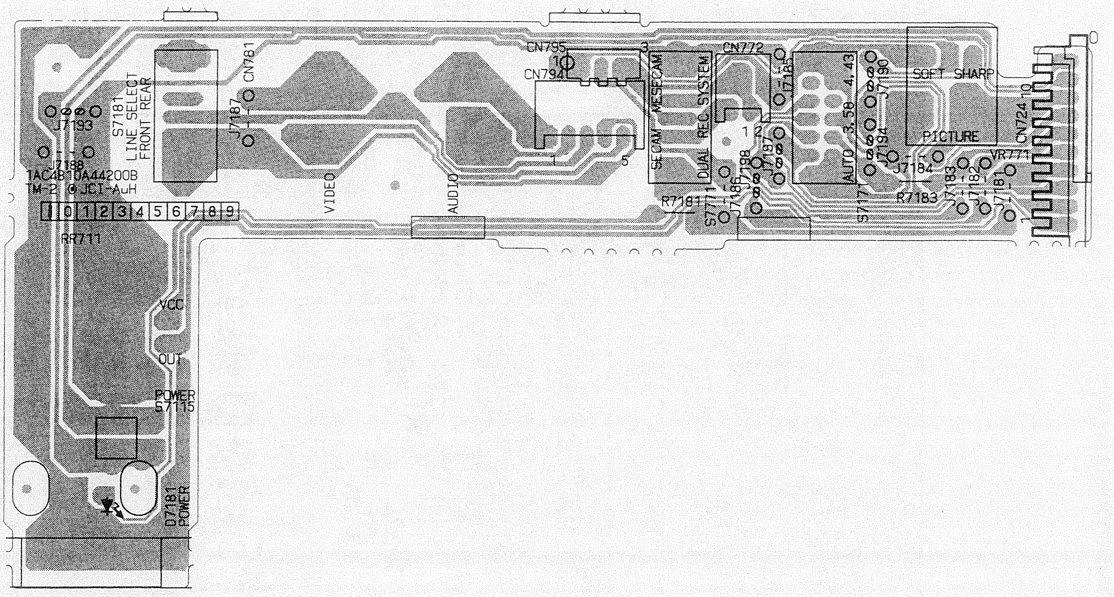

IC731 LA7214
SYNC.SEPARATION
C7307 22/16
C7308 0.1
R7309 470K
R7310 330K
C7303 10/16
C7306 1000P
R7314 100K
R7312 330K
R7311 330
C7305 2200P
C7304 0.33/50
R7313 270K
Q7303 2SK68A-K,L1 SWITCH
R7305 1M
R7308 10K
B7302 2SC3399 or DTC144ES SWITCH
AFT
B7301 2SA1345 or DTA144ES SWITCH
CN734
H.SYNC
AFT C
AFT MUTE
AUDIO MUTE
TO TM-1 CN714
TO PW-A
ALWAYS 12V
ALWAYS 5V
ALWAYS 45V
TO AD-A
TO VD-A
AV
TO TN-A
AUDIO MUTE
SD IN
AFT C.
AFT
LB
HB
UB
TU
BAND SELECTOR
IC702 LA7910
C7002 0.01
CN701
AV
BAND 1
BAND 2
PWM
CLK
DATA
CS
TO TM-1 CN711
IC703 UPC574J or L5631
C7004 22/50
C7003 0.1
R7001 3.9K
R7002 10K
R7009 5.6K
R7008 470
D7002 MTZ6.8C
D7001
Q7002 2SA984K-E,F or 2SB1436 REG
R7010 15K
R7006 22K
R7007 4.7K
R7005 47K
C7005 180P
C7007 0.33 (TF)
C7006 0.1 (TF)
Q7001 2SC2960-F or G SWITCH
R7004 10K
R7003 33K
VOL. SYN.
C7001 0.01
IC701 M6M80021P or M6M80011P MEMORY
TM-A (CP-1)

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

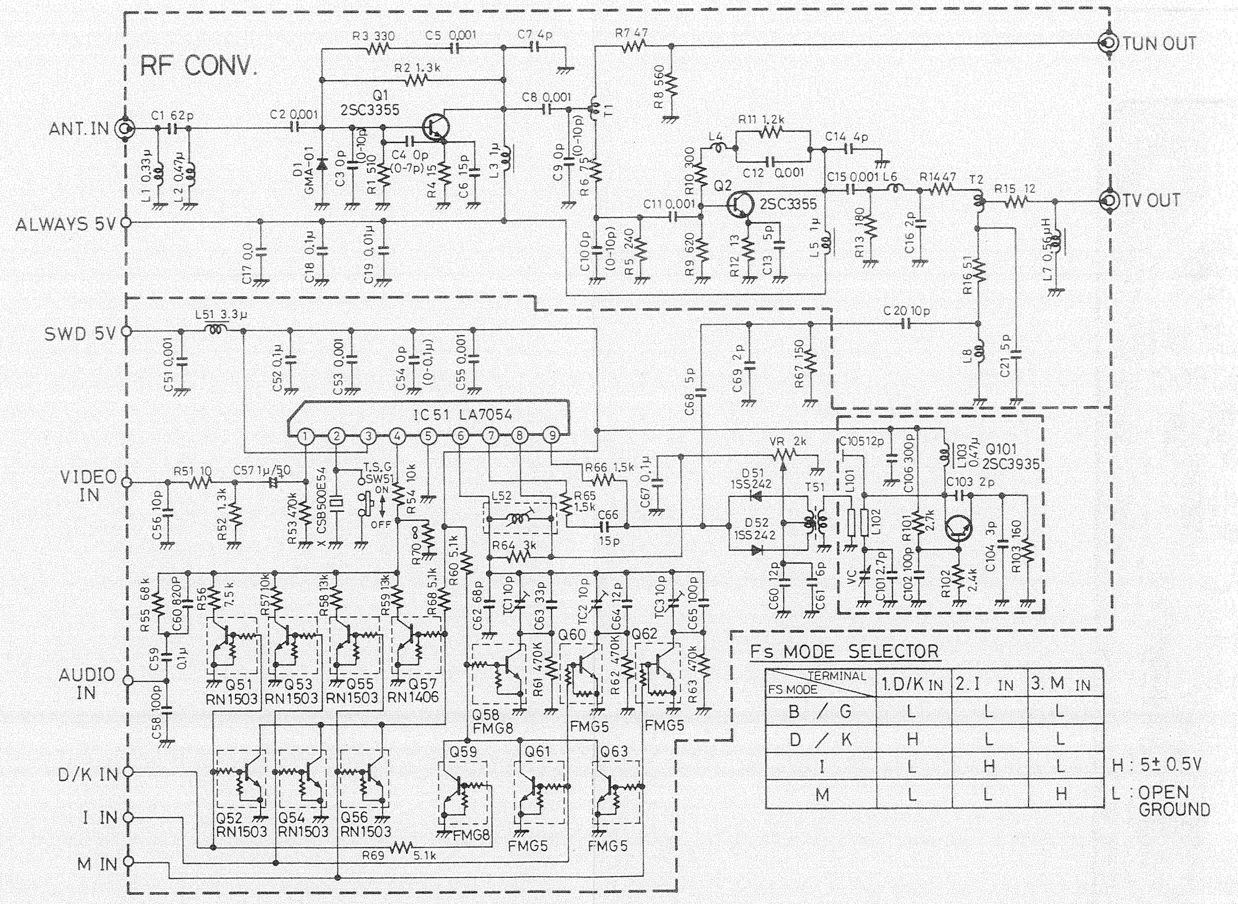
TM-1 P.C.B.


1AC4B10A44100B TM-1
JCI-AuH
LO. NO. 7101
S7120
S7108
S7105 PROG
S7117 CLOCK
S7129 PRESET
S7130 OK
S7137 ALL CLEAR
TAPE SPEED
ANT/VTRorVPS
TR-/F1-
TR+/F1+
EJECT S7114
S7102 STOP
S7125 REW
S7101 PLAY
S7126 FF
S7103 PAUSE
REC S7113
CH DOWN
CH UP
S7118
S7106
IC711
IC712
IC713
IC714
PAL
MESECAM
NT4.43
NT3.58
AUTO-TR
CN711
CN712
CN713
CN714
CN715

TM-2 P.C.B.


1AC4B10A442008
TM-2 JCI-AuH
S7181 LINE SELECT FRONT REAR
CN781
CN795
CN794
CN772
SECAM MESECAM
DUAL REC SYSTEM
AUTO 3.58 4.43
SOFT SHARP
PICTURE
CN724
VIDEO
AUDIO
VCC
OUT
POWER S7115
D7181 POWER

RF CONVERTER CIRCUIT DIAGRAM

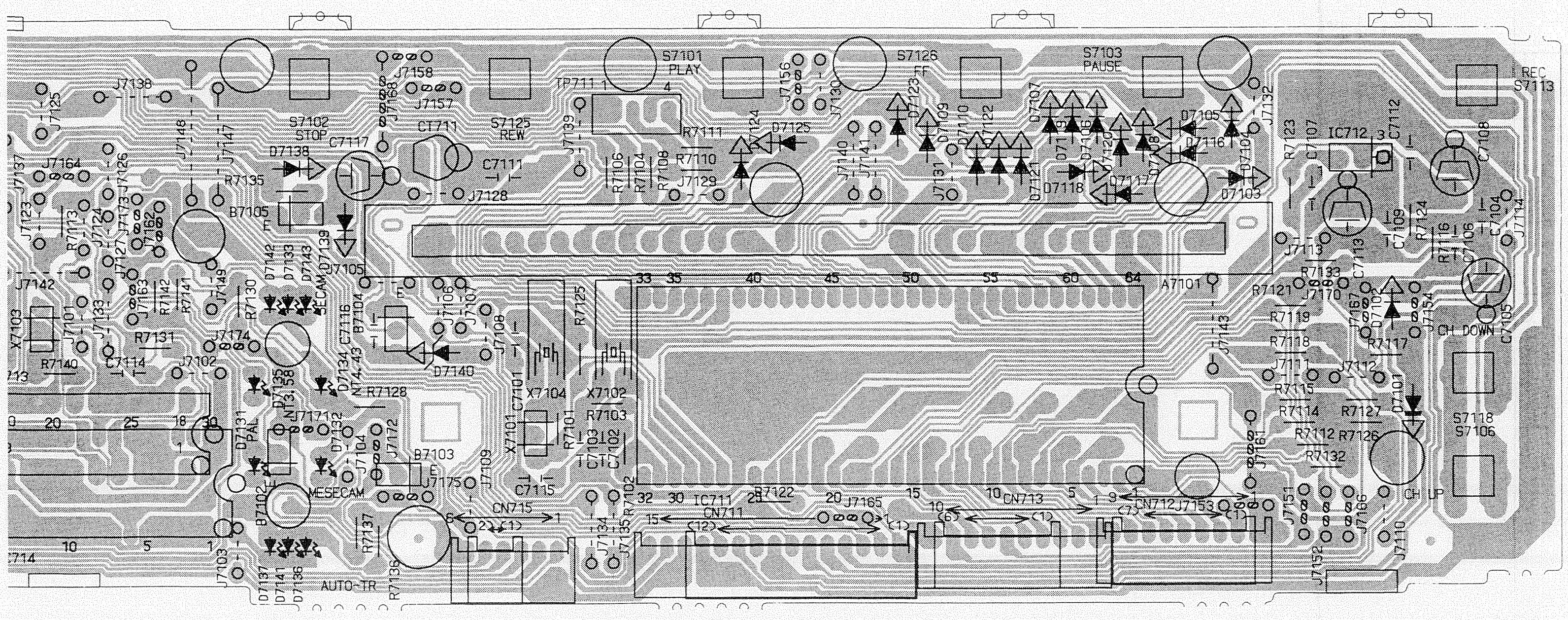

RF CONV.
ANT.IN
ALWAYS 5V
SWD 5V
VIDEO IN
AUDIO IN
D/K IN
I IN
M IN
TUN OUT
TV OUT
Q1 2SC3355
Q2 2SC3355
Q101 2SC3935
IC51 LA7054
D51 1SS242
D52 1SS242
Q51 RN1503
Q52 RN1503
Q53 RN1503
Q54 RN1503
Q55 RN1503
Q56 RN1503
Q57 RN1406
Q58 FMG8
Q59 FMG8
Q60 FMG5
Q61 FMG5
Q62 FMG5
Q63 FMG5
T.S.G SW51
ON OFF
VR 2k
R69 5.1k

Fs MODE SELECTOR

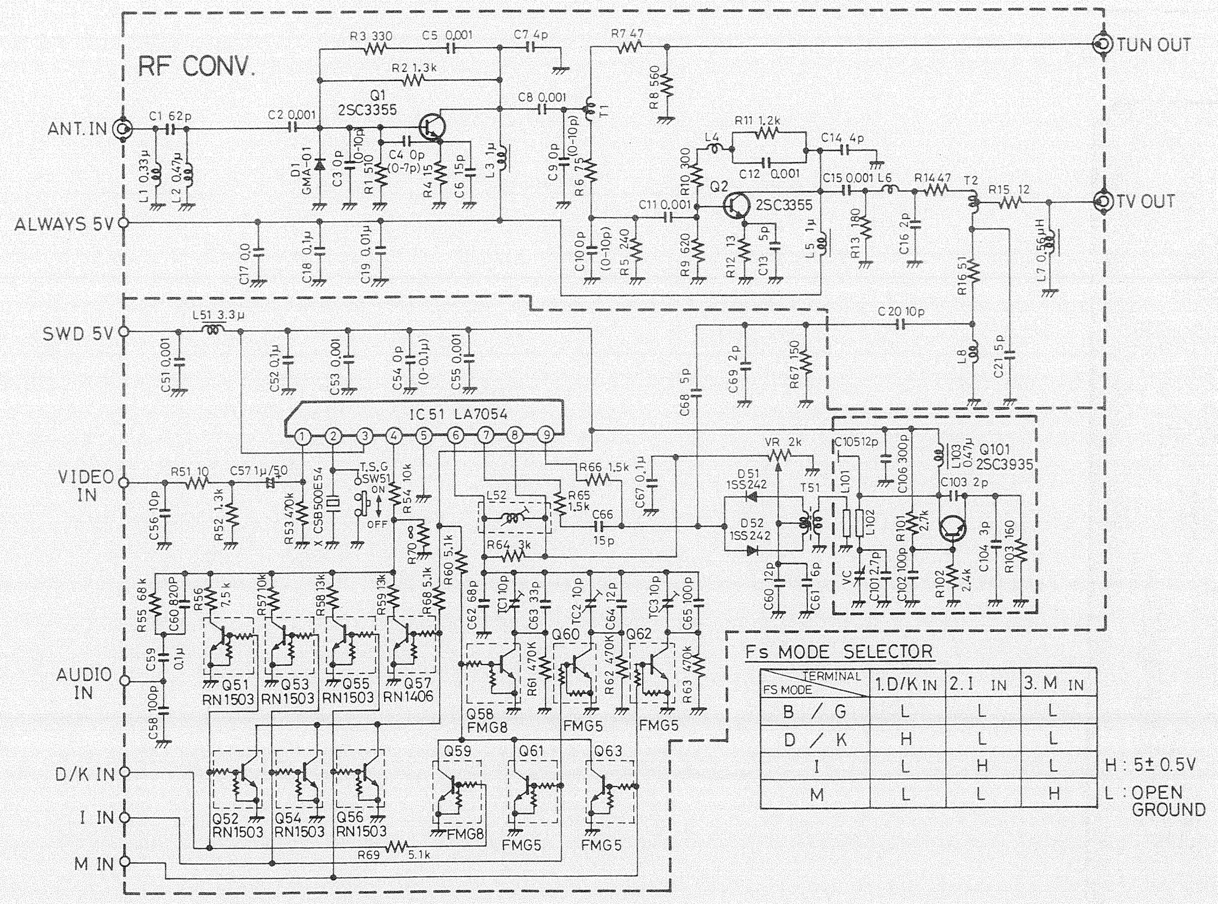
FS MODE \ TERMINAL	1.D/K IN	2.I IN	3.M IN
B / G	L	L	L
D / K	H	L	L
I	L	H	L
M	L	L	H

H : 5± 0.5V
L : OPEN
GROUND

TM-1 P.C.B.


S7101 PLAY
S7102 STOP
S7125 REW
S7126 FF
S7103 PAUSE
REC S7113
IC711
IC712
CN711
CN712
CN713
CN715
X7101
X7102
CH DOWN
CH UP
S7118
S7106
MESECAM
PAL
AUTO-TR

RF CONVERTER CIRCUIT DIAGRAM

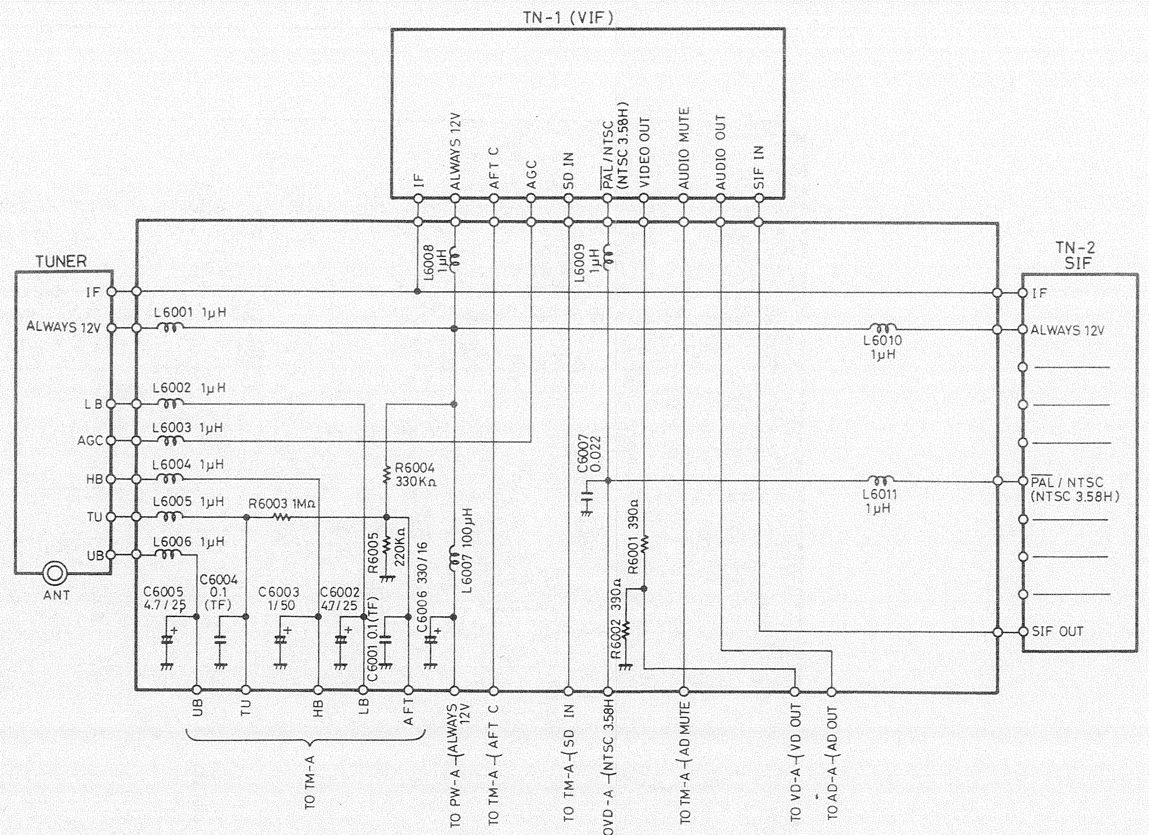

RF CONV.
ANT. IN
ALWAYS 5V
SWD 5V
VIDEO IN
AUDIO IN
D/K IN
I IN
M IN
TUN OUT
TV OUT
Q1 2SC3355
Q2 2SC3355
Q101 2SC3935
IC51 LA7054
D51 1SS242
D52 1SS242
T1
T2
T51
Q51 RN1503
Q52 RN1503
Q53 RN1503
Q54 RN1503
Q55 RN1503
Q56 RN1503
Q57 RN1406
Q58 FMG8
Q59 FMG8
Q60 FMG5
Q61 FMG5
Q62 FMG5
Q63 FMG5
R69 5.1k

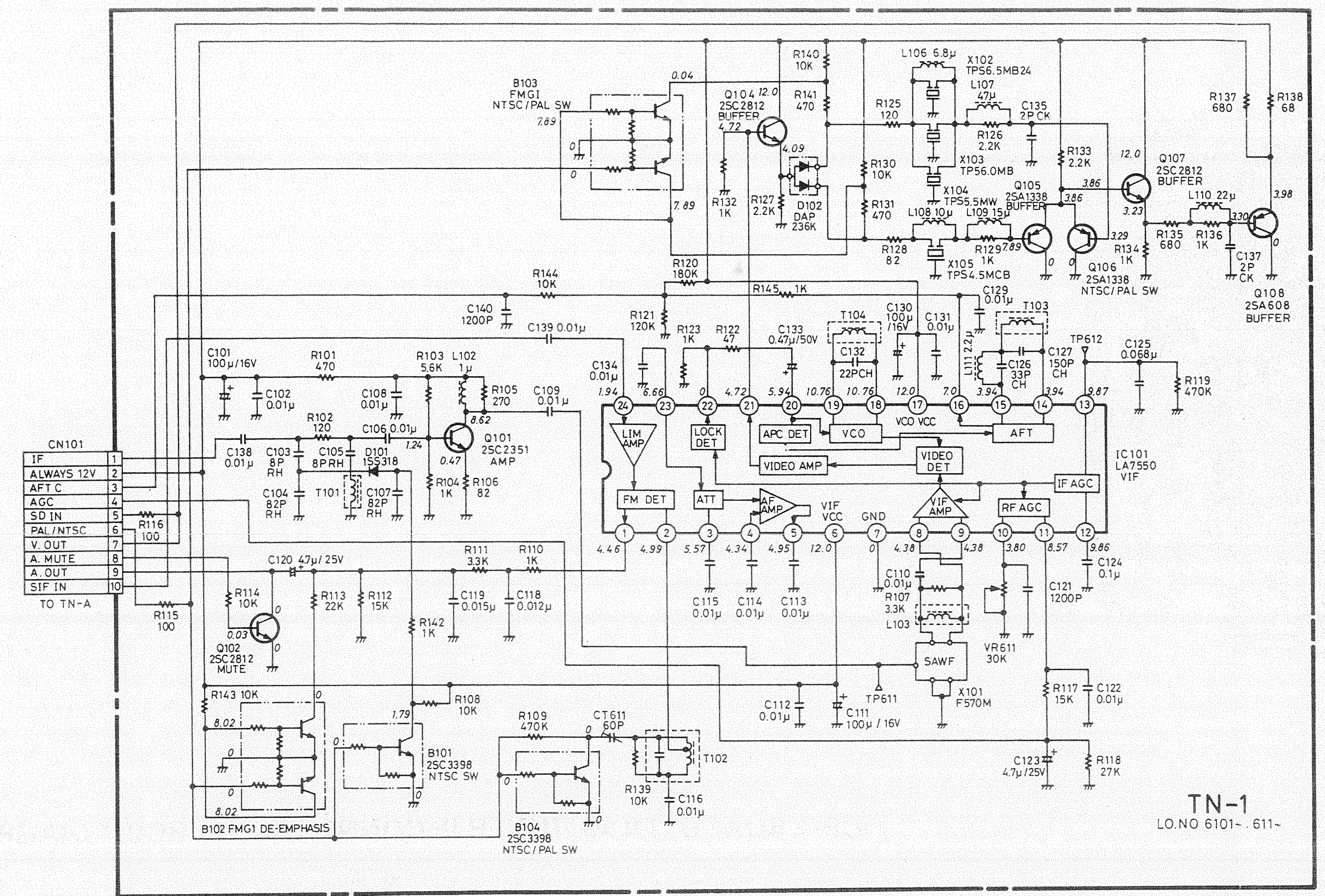
Fs MODE SELECTOR

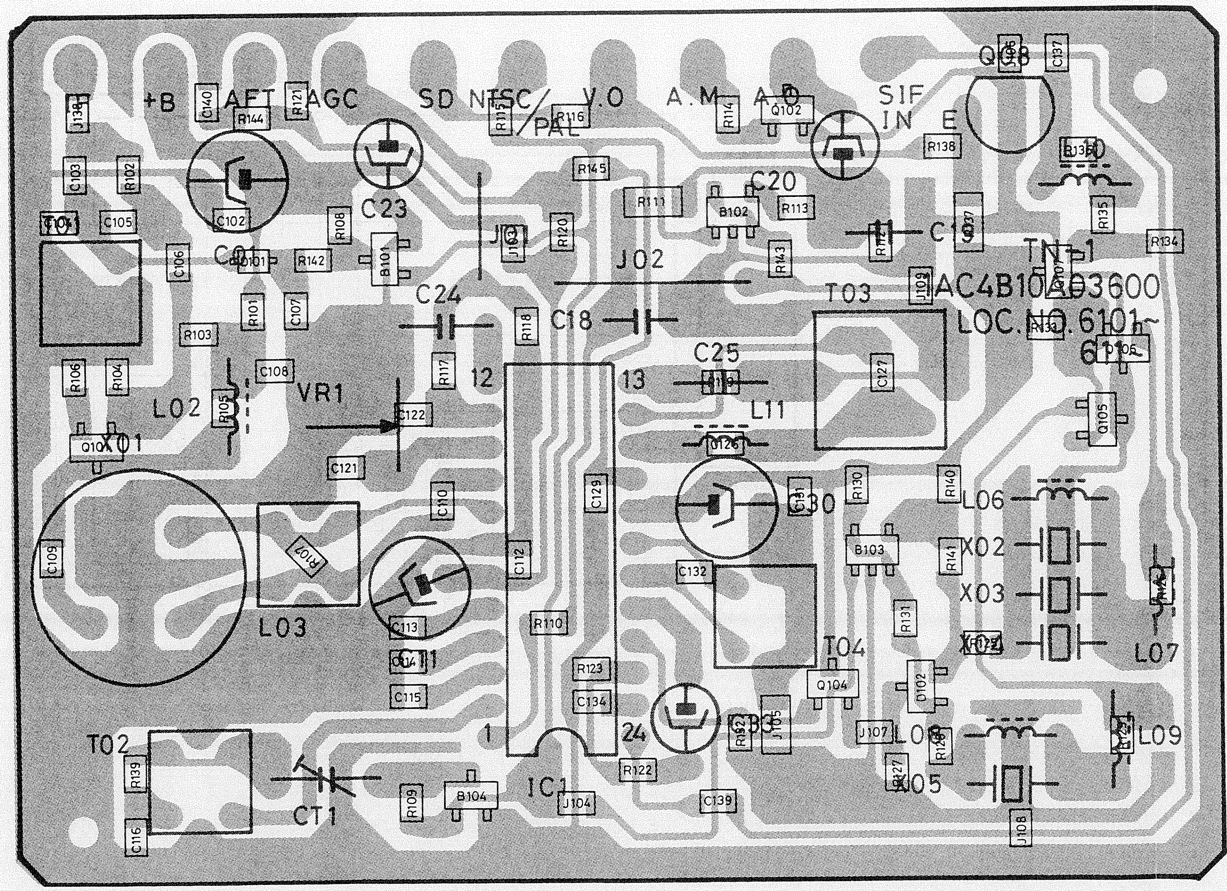
TERMINAL / FS MODE	1. D/K IN	2. I IN	3. M IN
B / G	L	L	L
D / K	H	L	L
I	L	H	L
M	L	L	H

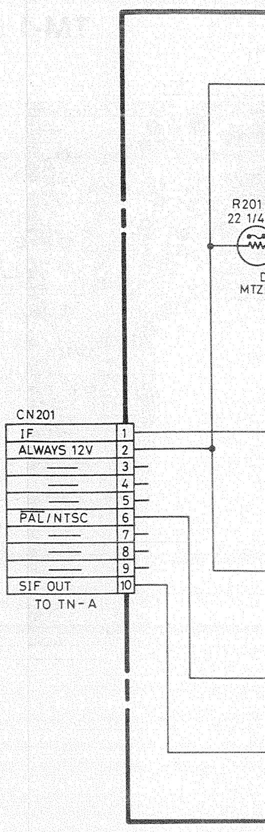
H : 5± 0.5V
L : OPEN
GROUND

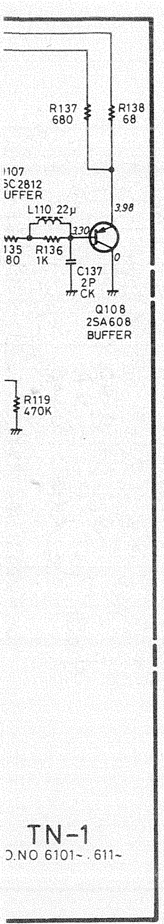
CP-1 BOARD (TN-A) TUNER IF CONNECTION CIRCUIT DIAGRAM

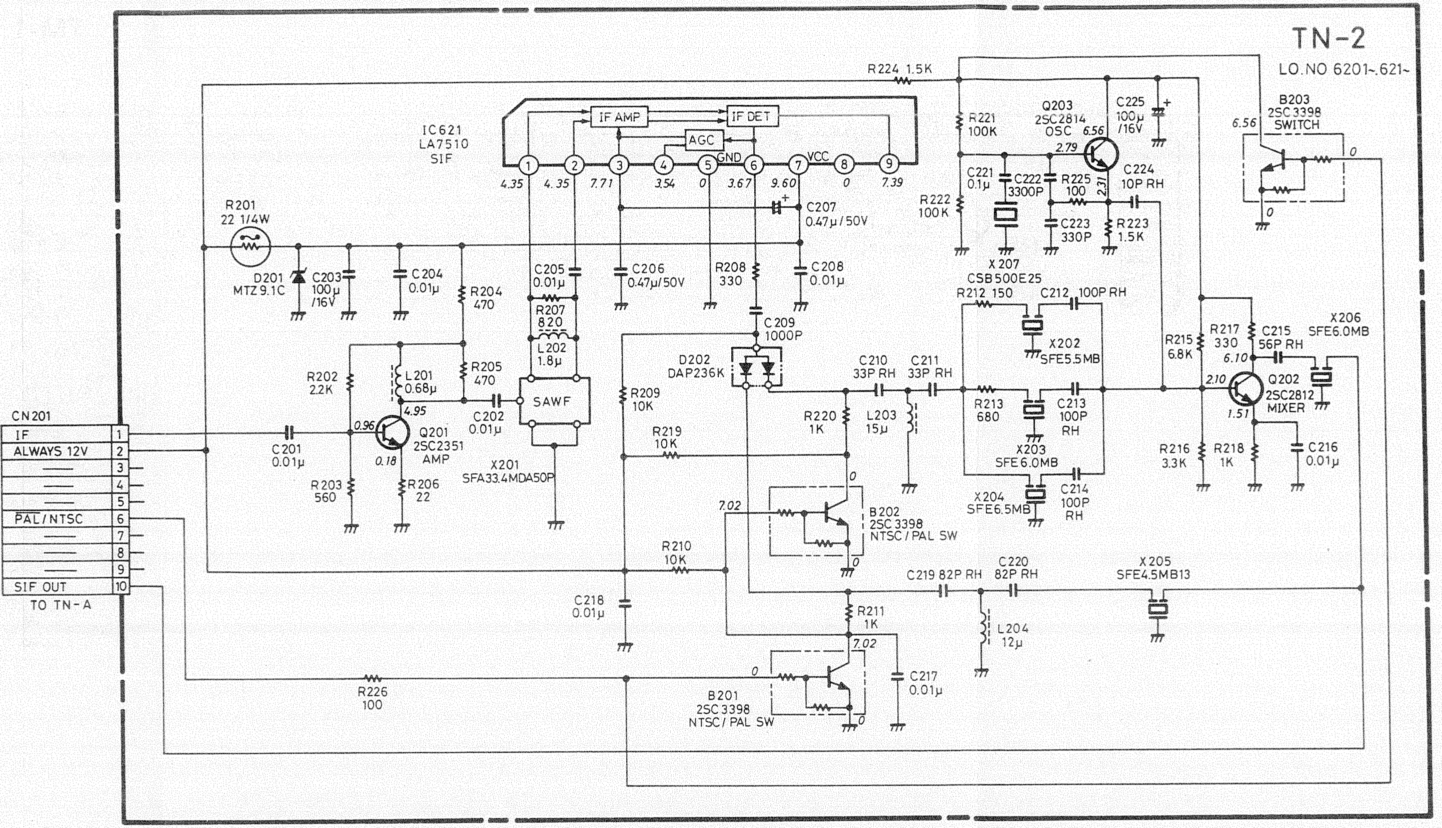

TN-1 (VIF)
IF
ALWAYS 12V
AFT C
AGC
SD IN
PAL / NTSC (NTSC 3.58H)
VIDEO OUT
AUDIO MUTE
AUDIO OUT
SIF IN
TUNER
IF
ALWAYS 12V
LB
AGC
HB
TU
UB
ANT
TN-2 SIF
IF
ALWAYS 12V
PAL / NTSC (NTSC 3.58H)
SIF OUT
L6001 1μH
L6002 1μH
L6003 1μH
L6004 1μH
L6005 1μH
L6006 1μH
L6007 100μH
L6008 1μH
L6009 1μH
L6010 1μH
L6011 1μH
R6001 390Ω
R6002 390Ω
R6003 1MΩ
R6004 330KΩ
R6005 220KΩ
C6001 0.01 (TF)
C6002 47/25
C6003 1/50
C6004 0.1 (TF)
C6005 4.7/25
C6006 330/16
C6007 0.022
UB
TU
HB
LB
AFT
TO TM-A
TO PW-A ALWAYS 12V
TO TM-A AFT C
TO TM-A SD IN
TO VD-A NTSC 3.58H
TO TM-A AD MUTE
TO VD-A VD OUT
TO AD-A AD OUT

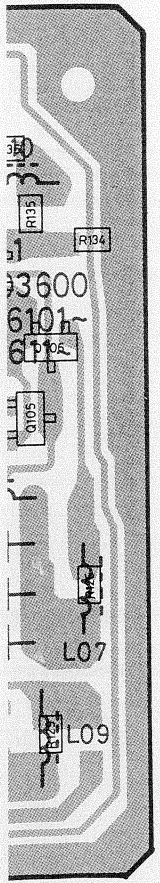

CN101
IF
ALWAYS 12V
AFT C
AGC
SD IN
PAL/NTSC
V. OUT
A. MUTE
A. OUT
SIF IN
TO TN-A
B103 FMG1 NTSC/PAL SW
Q104 2SC2812 BUFFER
R140 10K
R141 470
L106 6.8μ
X102 TPS6.5MB24
L107 47μ
C135 2P CK
R126 2.2K
X103 TPS6.0MB
X104 TPS5.5MW
L108 10μ
L109 15μ
X105 TPS4.5MCB
Q105 2SA1338 BUFFER
Q106 2SA1338 NTSC/PAL SW
Q107 2SC2812 BUFFER
L110 22μ
Q108 2SA608 BUFFER
R137 680
R138 68
R144 10K
R145 1K
R120 180K
R121 120K
D102 DAP 236K
C101 100μ/16V
R101 470
R102 120
R103 5.6K
L102 1μ
R105 270
C109 0.01μ
Q101 2SC2351 AMP
D101 1SS318
T101
C134 0.01μ
T104
T103
C132 22PCH
C126 33P CH
C127 150P CH
TP612
C125 0.068μ
R119 470K
LIM AMP
LOCK DET
APC DET
VCO
AFT
VIDEO AMP
VIDEO DET
IF AGC
FM DET
ATT
AF AMP
VIF VCC
GND
VIF AMP
RF AGC
IC101 LA7550 VIF
C120 47μ/25V
R111 3.3K
R110 1K
R114 10K
R113 22K
R112 15K
C119 0.015μ
C118 0.012μ
R142 1K
Q102 2SC2812 MUTE
R115 100
R116 100
C115 0.01μ
C114 0.01μ
C113 0.01μ
C110 0.01μ
R107 3.3K
L103
SAWF
VR611 30K
X101 F570M
C121 1200P
C124 0.1μ
R117 15K
C122 0.01μ
R143 10K
R108 10K
B101 2SC3398 NTSC SW
R109 470K
CT611 60P
T102
C112 0.01μ
TP611
C111 100μ/16V
C123 4.7μ/25V
R118 27K
R139 10K
C116 0.01μ
B102 FMG1 DE-EMPHASIS
B104 2SC3398 NTSC/PAL SW
TN-1
LO.NO 6101~, 611~

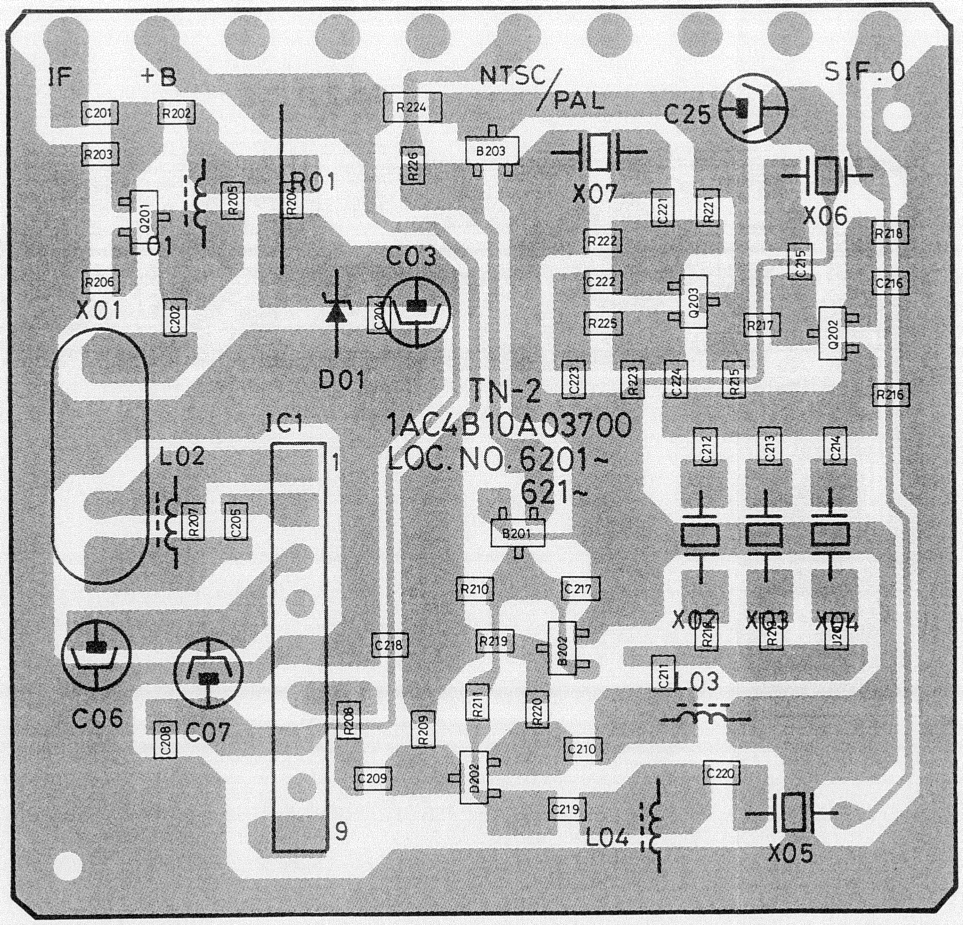

IF
+B
AFT
AGC
SD
NTSC/PAL
V.O
A.M
A.O
SIF IN
E
C23
C01
C20
C24
J01
J02
C18
C25
L11
T03
TN-1
1AC4B10A03600
LOC.NO.6101~
611~
L02
VR1
X01
L03
C11
C30
T04
IC1
CT1
T02
L06
X02
X03
X04
L07
L08
L09
X05
12
13
24
1


R201
22 1/4
MTZ
CN201
IF
ALWAYS 12V
PAL/NTSC
SIF OUT
TO TN-A


R137
680
R138
68
Q107
2SC2812
BUFFER
L110 22µ
R135
680
R136
1K
C137
2P
CK
3.98
Q108
2SA608
BUFFER
R119
470K
TN-1
LO.NO 6101~,611~


TN-2
LO.NO 6201~,621~
R224 1.5K
IC621
LA7510
SIF
IF AMP
IF DET
AGC
GND
VCC
4.35
4.35
7.71
3.54
0
3.67
9.60
0
7.39
R201
22 1/4W
D201
MTZ9.1C
C203
100µ
/16V
C204
0.01µ
R204
470
C205
0.01µ
R207
820
L202
1.8µ
C206
0.47µ/50V
R208
330
C207
0.47µ/50V
C208
0.01µ
C209
1000P
R202
2.2K
L201
0.68µ
4.95
R205
470
SAWF
C202
0.01µ
Q201
2SC2351
AMP
0.96
0.18
R203
560
R206
22
X201
SFA33.4MDA50P
CN201
IF
ALWAYS 12V
PAL/NTSC
SIF OUT
TO TN-A
1
2
3
4
5
6
7
8
9
10
C201
0.01µ
R209
10K
R219
10K
D202
DAP236K
R220
1K
L203
15µ
C210
33P RH
C211
33P RH
R221
100K
R222
100K
C221
0.1µ
C222
3300P
X207
CSB500E25
Q203
2SC2814
OSC
6.56
2.79
2.17
R225
100
C223
330P
R223
1.5K
C224
10P RH
C225
100µ
/16V
B203
2SC3398
SWITCH
6.56
0
R212 150
C212
100P RH
X202
SFE5.5MB
R213
680
X203
SFE6.0MB
C213
100P
RH
C214
100P
RH
X204
SFE6.5MB
R215
6.8K
R217
330
C215
56P RH
X206
SFE6.0MB
6.10
2.10
1.57
Q202
2SC2812
MIXER
R216
3.3K
R218
1K
C216
0.01µ
B202
2SC3398
NTSC/PAL SW
7.02
0
R210
10K
C218
0.01µ
C219 82P RH
C220
82P RH
X205
SFE4.5MB13
R211
1K
L204
12µ
7.02
C217
0.01µ
R226
100
B201
2SC3398
NTSC/PAL SW
0


R135
R134
03600
6101~
61
Q105
L07
L09


IF
+B
NTSC/PAL
SIF.0
C201
R202
R224
R203
R226
B203
X07
C25
X06
Q201
R205
R01
L01
R206
C221
R221
R222
R218
C03
C215
C216
X01
C202
C222
Q203
R217
Q202
R225
D01
C223
R223
C224
R215
R216
TN-2
1AC4B10A03700
LOC.NO.6201~
621~
IC1
1
L02
R207
C205
C212
C213
C214
B201
R210
C217
X02
X03
X04
C06
C07
C218
R219
B202
C211
L03
C208
R208
R209
R211
R220
C210
C209
D202
C220
C219
L04
X05
9

9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

SECTION 5
MECHANISM SERVICE TECHNICAL INFORMATION

1. OUTLINE OF MECHANISM

This mechanism is named P-88 Mechanism. Its features include :

(1) The chassis is fabricated by drawing a 1.6mm thick electric zinc plated steel sheet, and mechanical parts are ingeniously laid on this chassis. The mechanism is as thick as 70.3 mm, which indicates that it is 86 % thicker than conventional mechanisms hitherto available.

(2) After insertion of a cassette, the tape is normally wound to the head drum based on the full loading system. This design results in the shortening of the mode shift time, that is, the time from the depression of the PLAY pushbutton switch to the video image display on screen has been significantly quickened.

(3) The full loading system employed has the F/R search capability (when the same button (F.FWD or REW) is pressed in the F.FWD or REW modes, the search mode playback image appears on the screen).

(4) Also, a thin type head drum without lead is provided to increase the operating convenience of the equipment to a considerable extent.

(5) The drive source for cassette loading and the motor for the tape loading mode selection are used in combination with the head motor and the capstan motor for realization of a 3-motor system.

1-1. FULL LOADING MECHANISM

I. Quick playback
Mode shift time such as the STOP→PLAY and FF/REW→PLAY has been shortened for quicker playback.

II. High-speed VISS and VASS
The time from the detection of VISS/VASS search signal based on the VHS standardized search system till image display on the screen has considerably been shortened to make high-speed VISS and VASS possible.

(1) Description of full loading mechanism
As shown in Fig. 1-1 ⓐ, ⓑ, a tape has hitherto been wound onto the head drum only in the PLAY and F/R SEARCH mode, but in this radically new mechanism, in every mode can be made with the tape kept wound onto the head drum.

(2) Features of full loading mechanism
With the provision of the full loading mechanism, the operating convenience, which was hitherto a drawback of the VHS system, has been improved. A host of other salient features are also designed into this mechanism as apparent from the following description.

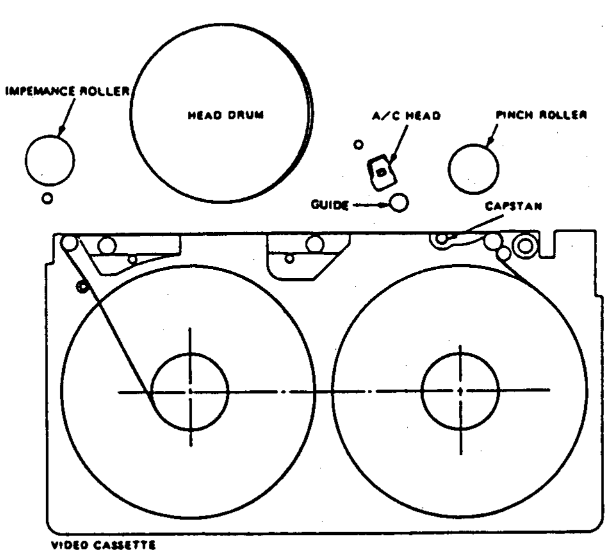


Fig. 1-1 ⓐ CONVENTIONAL VHS TAPE LOADING SYSTEM (AT FF/REW MODE)

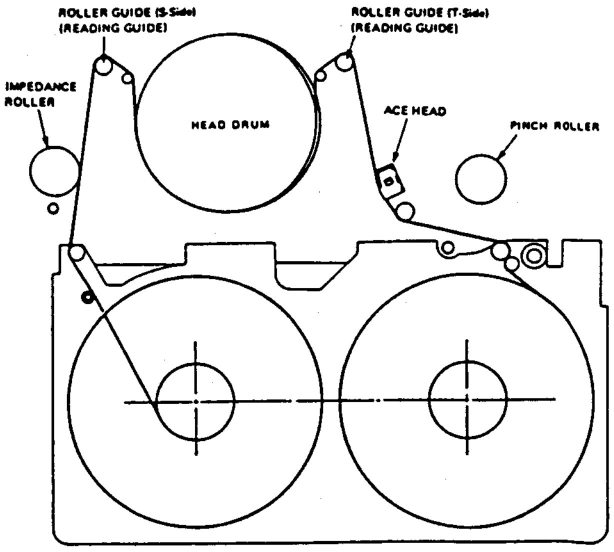


Fig. 1-1 ⓑ NEW FULL LOADING SYSTEM (AT FF/REW MODE)

III. F/R search
FF ↔ F-SEARCH and REW ↔ R-SEARCH can be made direct by reducing the mode transition

IV. Elimination of half loading mechanism
A special mechanism (the half loading mechanism in Fig. 1-2.) necessary for mounting the VISS/VASS functions and a realtime counter has hitherto been added to conventional models available, but the provision of the full loading mechanism simplifies the design of the mechanism, resulting in significantly enhanced reliability and increased convenience of operation.

(3) Protection mechanism for full loading system

I. Video Tape Protection Mechanism

(a) FF/REW → STOP
Tape tension applied to the head drum when stopping is lowered by optimizing the balance between the left and right, and brake forces acting on the left and right reel table. Thereby it prevents from causing a scratch on the tape due to V-head when stopping.

(b) STOP → FF/REW
The starting-up speed of the capstan motor is ingeniously designed to preclude the possibility of unusual tape tension at the time of REW/FWD start-up.

(c) Tape end brake damping
The design of the mechanism is so made that the time from issuance of an electrical STOP command till actual brake application is reduced to a minimum. This enable the braking to be completed before the reader tape end.

(d) FF/REW running
To ensure highly stable tape running in any condition and any environment, design consideration is given to the foundation brake torque (soft brake) to the reel table and the tape winding angle with respect to each tape guide. Particularly in regard to the supply side fixing guide and F.T.E (Full Track Erase) head, the design is so made that they do not come into contact with the tape at the time of FF/REW operation to alleviate load application.

II. Final End Position Tape Loading Protection Mechanism
Tape pull-out (loading) from within the cassette is done to ensure proper take-up of the tape onto the head drum. At that time, the tape is extended from the supply reel side.
So, if the tape is wound to the final end, no loading can be made. For this reason, a mode is designed to allow the tape to be rewound a little at the final end of the tape without any loading done.

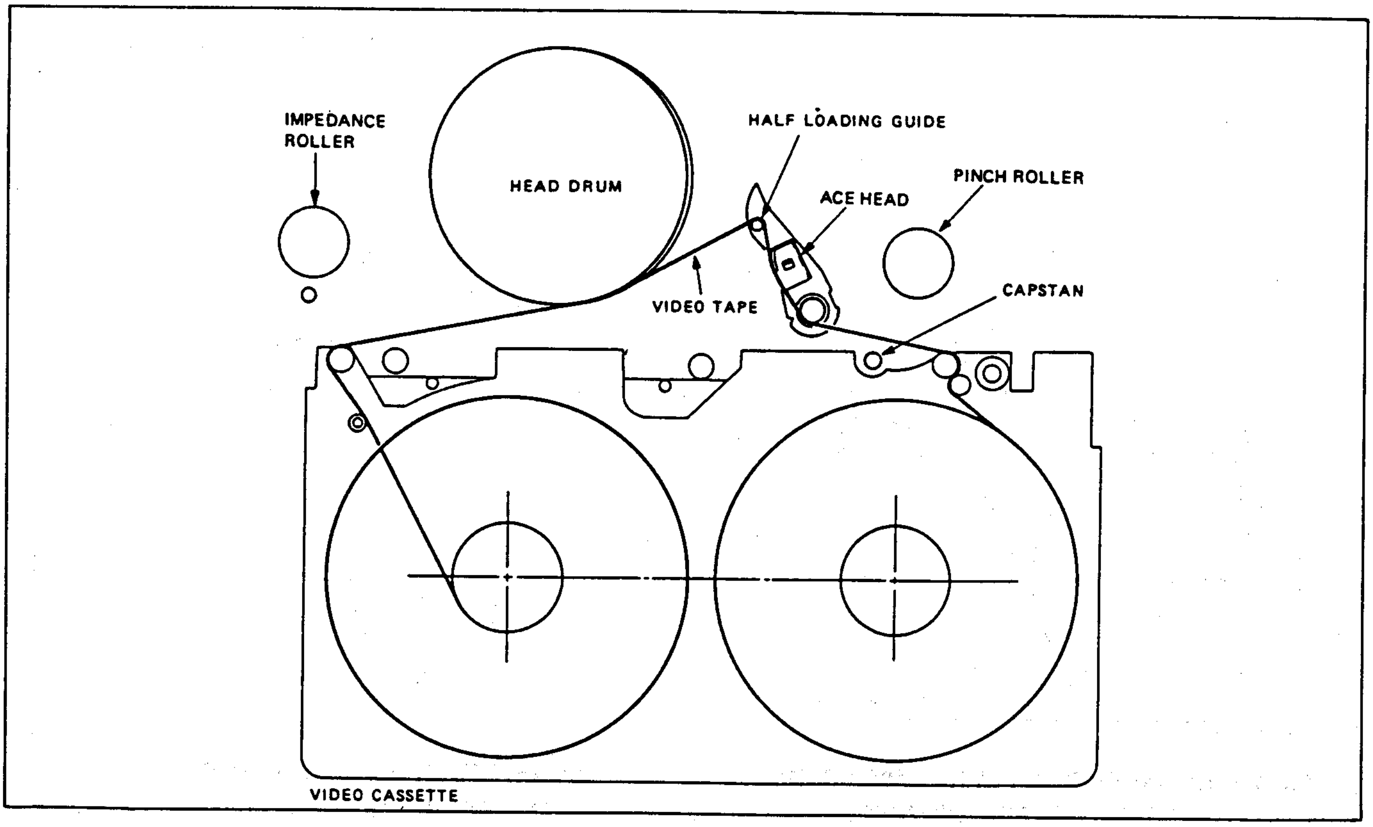


Fig. 1-2 HALF LOADING SYSTEM (AT FF/REW MODE)

2. DESCRIPTION OF MECHANISM OPERATION

2-1. BASIC OPERATION MODE OF MECHANISM

The P-88 mechanism has its original modes such as given in Table 2-1, in addition to the VTR is operation modes (STOP, FF, REW, PLAY, REC, R-SEARCH, F-SEARCH, STILL, SLOW, and ETS). These modes specific to the mechanism play important roles in tape protection operation at the time of a shift to various modes of the VTR above. A shift to the mode specific to the mechanism is carried out by controlling the rotation of the loading motor with the control signal of the system control circuit. The detection of important mechanism operation mode positions is done by using the FL START SWITCH for detecting the cassette ejection/insertion, the FL END SWITCH for detecting the cassette insert completion, and the MECHANISM MODE SWITCH for detecting each mode of the mechanism (3 bit MODE DATA is output by operating the rotary switch).

Mechanism Mode	Mechanism Mode Switch			HEX DATA	Function	Main Mode Shifting Conditions	VTR Operation Mode
	3	2	1				
EJECT	-	-	-		Eject position		EJECT
					Front loading/Unloading		
SHORT REW	-	-	-		Take up operation in the tape end position		Detected by FL END switch
INITIAL	1	1	1	⑦	Power off position		Power off when tape is loaded completely
					Tape unloading position Tape loading Tape loading ending position		
BRAKE	0	0	1	①	Main brake applying position		
STOP / FF/REW	0	1	0	②	STOP waiting and FF/REW (the head motor rotation)		STOP, FF/REW
STILL	0	1	1	③	The positions of STILL, SLOW or F-ADV.		STILL, SLOW, F-ADV
PLAY	1	0	0	④	From FWD direction Normal running mode		PLAY, REC, F-SEARCH
IDLER	1	0	1	⑤	Forward/reverse changeover position		PAUSE
REV	1	1	0	⑥	From REV direction Normal running mode		R-SERACH

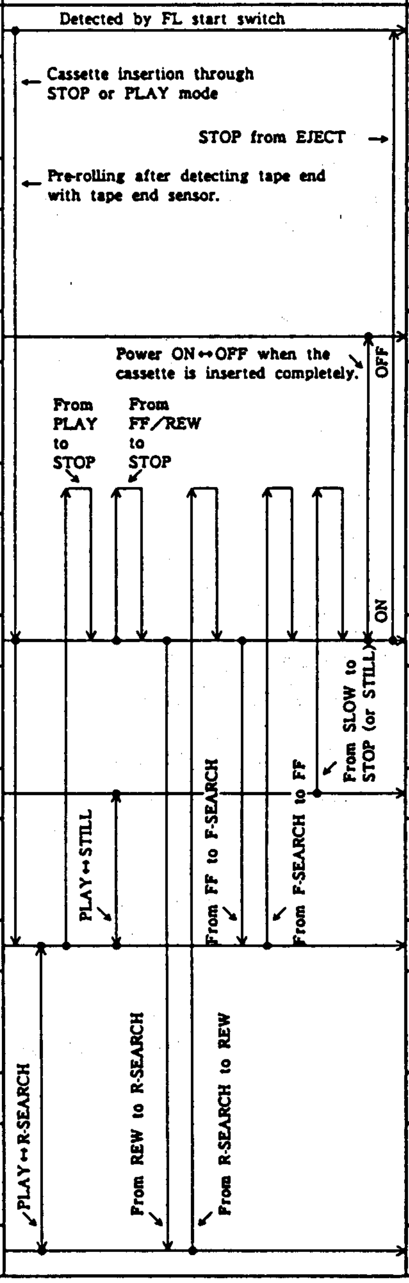

Detected by FL start switch
Cassette insertion through STOP or PLAY mode
STOP from EJECT
Pre-rolling after detecting tape end with tape end sensor.
Power ON↔OFF when the cassette is inserted completely.
OFF
ON
From PLAY to STOP
From FF/REW to STOP
From SLOW to STOP (or STILL)
PLAY↔STILL
From FF to F-SEARCH
From F-SEARCH to FF
PLAY↔R-SEARCH
From REW to R-SEARCH
From R-SEARCH to REW

Table 2-1

2-2. DESCRIPTION OF MECHANISM DRIVE

To realize the thin type mechanism, a loading motor and two pieces of cam (MAIN CAM GEAR and the MODE CAM GEAR) to be driven by the said motor are mounted on the upper part of the capstan motor, that was a dead space in the conventional mechanisms hitherto available with a view to optimization of parts mounting layout. (Fig. 2-1 and Fig. 2-2.)

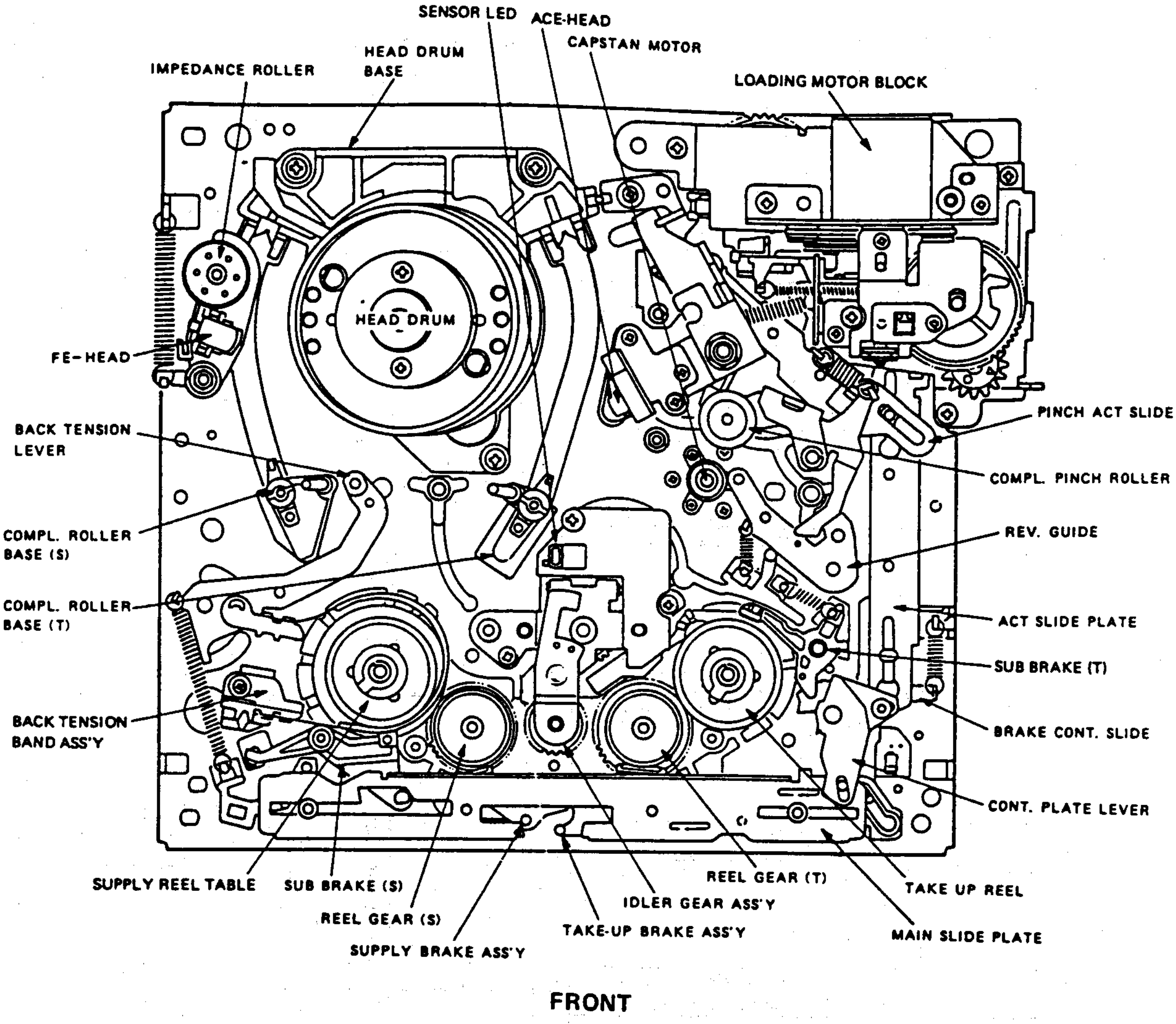

SENSOR LED
ACE-HEAD
CAPSTAN MOTOR
HEAD DRUM BASE
IMPEDANCE ROLLER
LOADING MOTOR BLOCK
HEAD DRUM
FE-HEAD
BACK TENSION LEVER
COMPL. ROLLER BASE (S)
COMPL. ROLLER BASE (T)
BACK TENSION BAND ASS'Y
PINCH ACT SLIDE
COMPL. PINCH ROLLER
REV. GUIDE
ACT SLIDE PLATE
SUB BRAKE (T)
BRAKE CONT. SLIDE
CONT. PLATE LEVER
SUPPLY REEL TABLE
SUB BRAKE (S)
REEL GEAR (S)
SUPPLY BRAKE ASS'Y
TAKE-UP BRAKE ASS'Y
IDLER GEAR ASS'Y
REEL GEAR (T)
TAKE UP REEL
MAIN SLIDE PLATE
FRONT

Fig. 2-1 TOP VIEW OF MECHANINSM

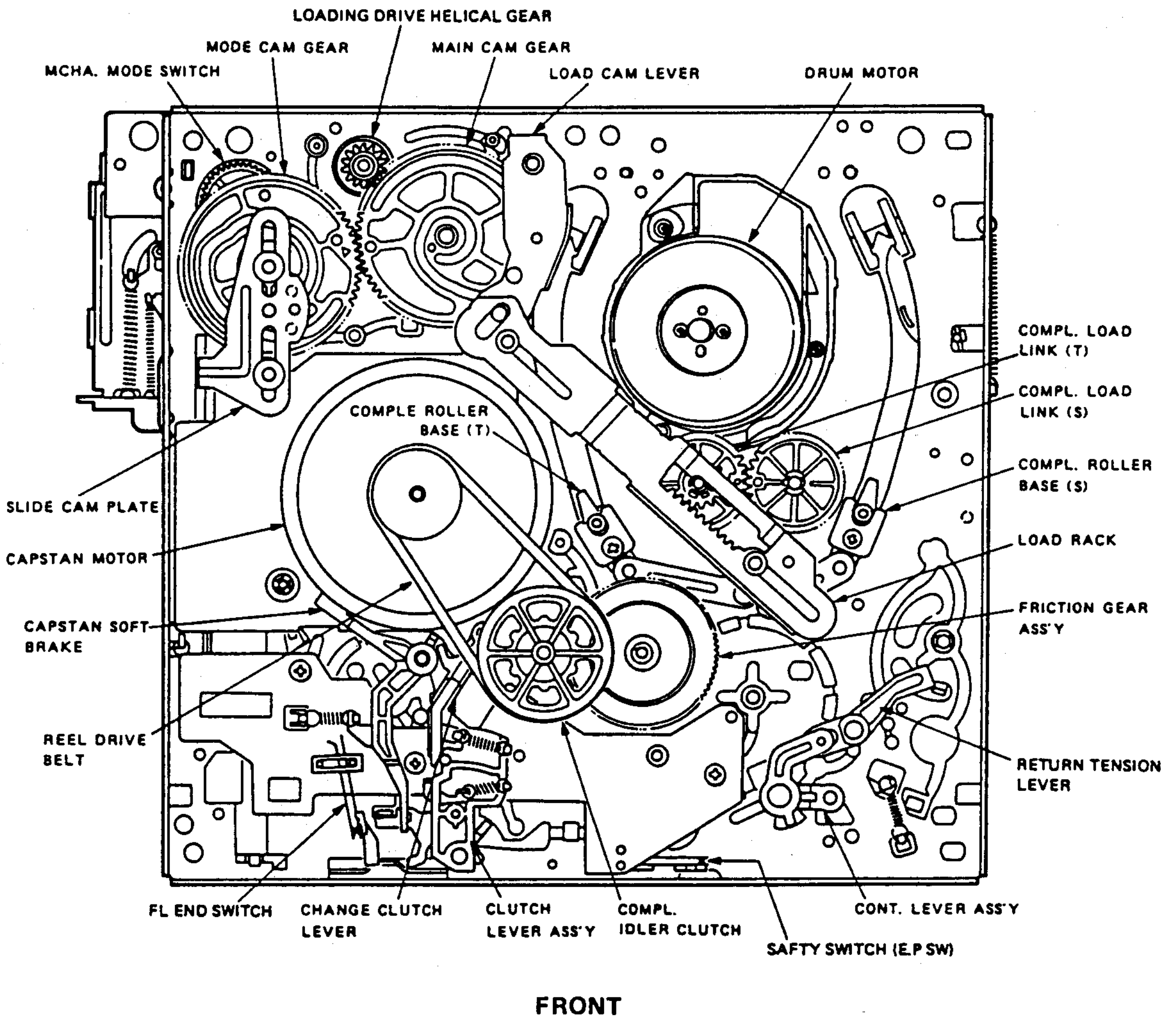

LOADING DRIVE HELICAL GEAR
MODE CAM GEAR
MAIN CAM GEAR
MCHA. MODE SWITCH
LOAD CAM LEVER
DRUM MOTOR
COMPL. LOAD LINK (T)
COMPL. LOAD LINK (S)
COMPLE ROLLER BASE (T)
COMPL. ROLLER BASE (S)
SLIDE CAM PLATE
LOAD RACK
CAPSTAN MOTOR
FRICTION GEAR ASS'Y
CAPSTAN SOFT BRAKE
REEL DRIVE BELT
RETURN TENSION LEVER
FL END SWITCH
CHANGE CLUTCH LEVER
CLUTCH LEVER ASS'Y
COMPL. IDLER CLUTCH
CONT. LEVER ASS'Y
SAFTY SWITCH (E.P SW)
FRONT

Fig. 2-2 BOTTOM VIEW OF MECHANISM

These two cams have one CAM GROOVE on both sides. A total of four CAM GROOVEs performs independent functions to meet the multi-function needs of these days by driving the elements of a wide variety of functions with the motor precisely controlled by a microcomputer.

The two cams are positive motion cams having a groove over 570 degrees. These cams cause the amount of lift to be changed by a mild gradient according to the angle of rotation while synchronizedly being rotated by an outer circumferential gear to alleviate the load exerted on the cams when driving the rod linked with the cams and also to ensure position stability in each mode of operation. The geometry of each cam and that of a metal fitting of the drive section are shown in Fig. 2-3 and Fig. 2-4, respectively. Also, the role of each cam used is described below.

On the GROOVE 3 side of MODE CAM GEAR have a small gear. This small gear is engaged with the MECHANISM MODE SWITCH as shown in Fig. 2-3., and detect the mechanism operation mode. In this way, the two cams and the MECHANISM MODE SWITCH are rotated synchronously, and the mechanism is fully synchronized and driven for each mode.

MAIN CAM GEAR : CAM GROOVE 1.
Pinch roller pressing operation
CAM GROOVE 2.
Tape loading mechanical drive
MODE CAM GEAR : CAM GROOVE 3.
Brake and clutch selecting operation
CAM GROOVE 4.
Brake control and front unloading control

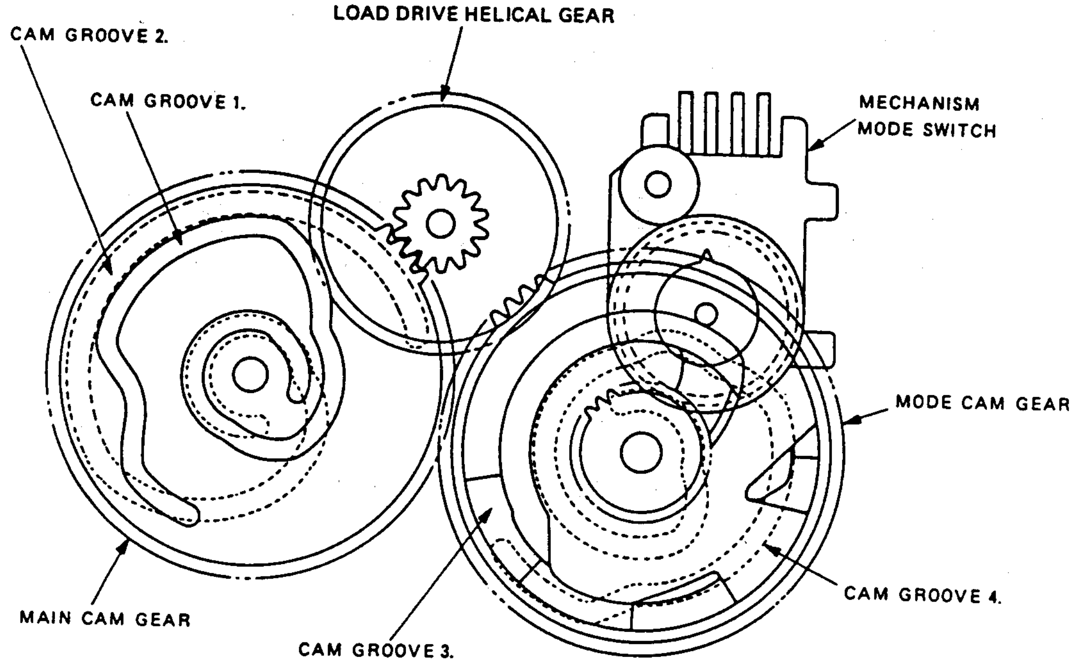


Fig. 2-3 PLAN OF CAMS CONSTRUCTION

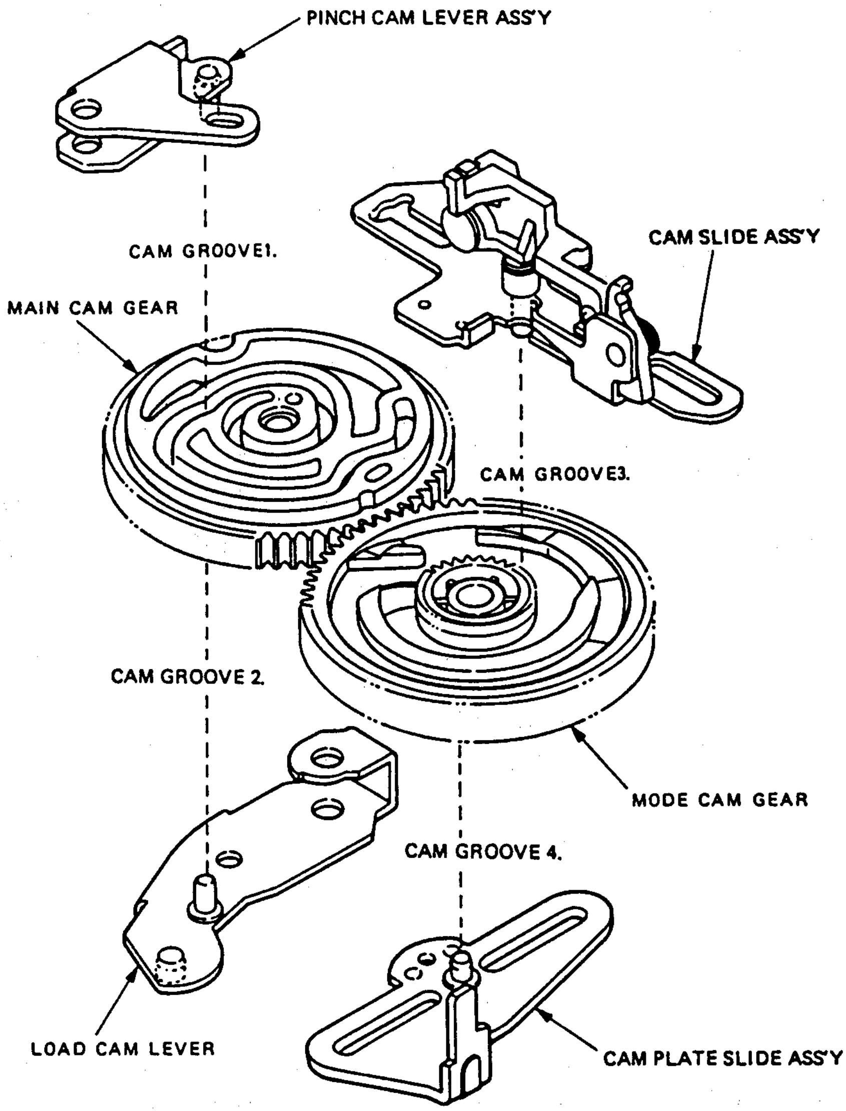

PINCH CAM LEVER ASS'Y
CAM SLIDE ASS'Y
CAM GROOVE1.
MAIN CAM GEAR
CAM GROOVE3.
CAM GROOVE 2.
MODE CAM GEAR
CAM GROOVE 4.
LOAD CAM LEVER
CAM PLATE SLIDE ASS'Y

Fig. 2-4 VIEW OF CAMS CONSTRUCTION

2-2-1. Tape Loading Mechanism

The tape loading mechanism is compactly designed with use of a LOAD RACK for loading by drive from the before-mentioned MAIN CAMs with CAM GROOVE 2. The LOAD RACK is laid on the dead space in between the DD capstan motor and the head motor for effective space utilization.(Fig. 2-5) The process from tape pull-out upon loading to contact of the leading guide section with the stopper of drum base and press-fitting under tension of spring is guided and driven in such a manner that the rod is drawn inward from the outer circumferential direction of the CAM GROOVE 2, thereby reducing the load torque (PV value) to the CAM GROOVE. And, the load of the loading motor is minimized to enhance reliability.

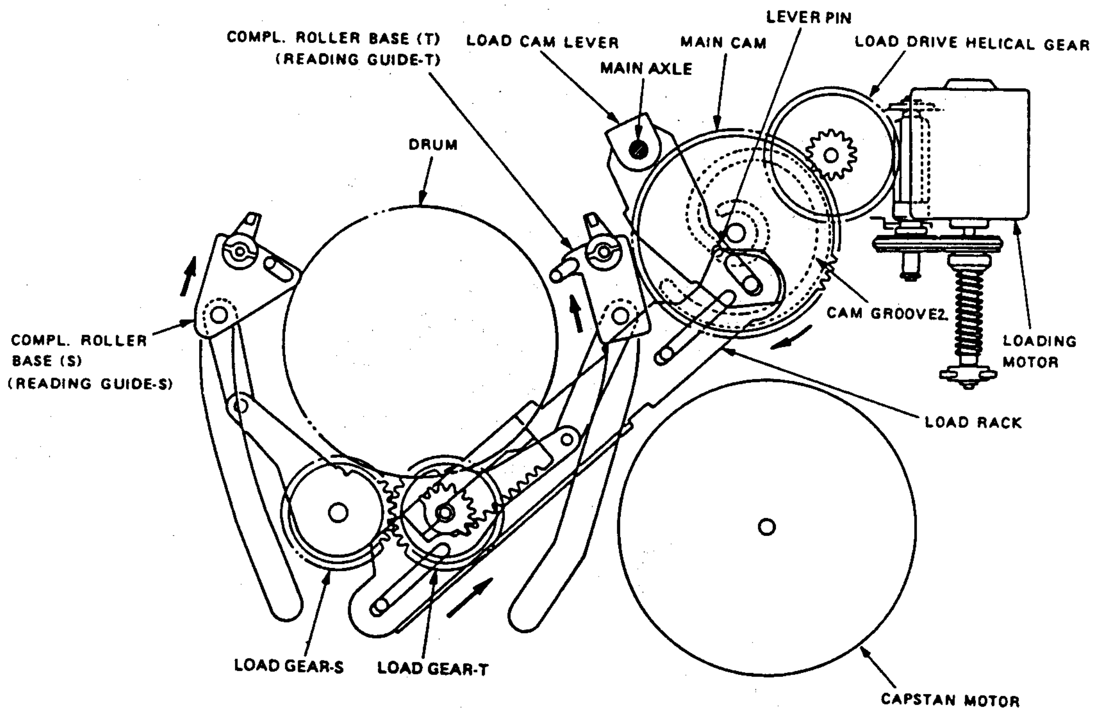

LEVER PIN
COMPL. ROLLER BASE (T) (READING GUIDE-T)
LOAD CAM LEVER
MAIN CAM
LOAD DRIVE HELICAL GEAR
MAIN AXLE
DRUM
COMPL. ROLLER BASE (S) (READING GUIDE-S)
CAM GROOVE2
LOADING MOTOR
LOAD RACK
LOAD GEAR-S
LOAD GEAR-T
CAPSTAN MOTOR

Fig. 2-5 CONSTRUCTION OF TAPE LOADING MECHANISM

2-2-2. Pinch Roller Pressing Mechanism

The PINCH LEVER assembly of the pinch roller is operated by the PINCH CAM LEVER (rod) driven by the CAM GROOVE 1 of the before-mentioned MAIN CAM, and then press-fitted to the capstan. The revolving tape guide (REV.GUIDE) is interlockingly operated with the PINCH LEVER assembly to ensure stable tape running at a fixed speed. (Fig. 2-6)

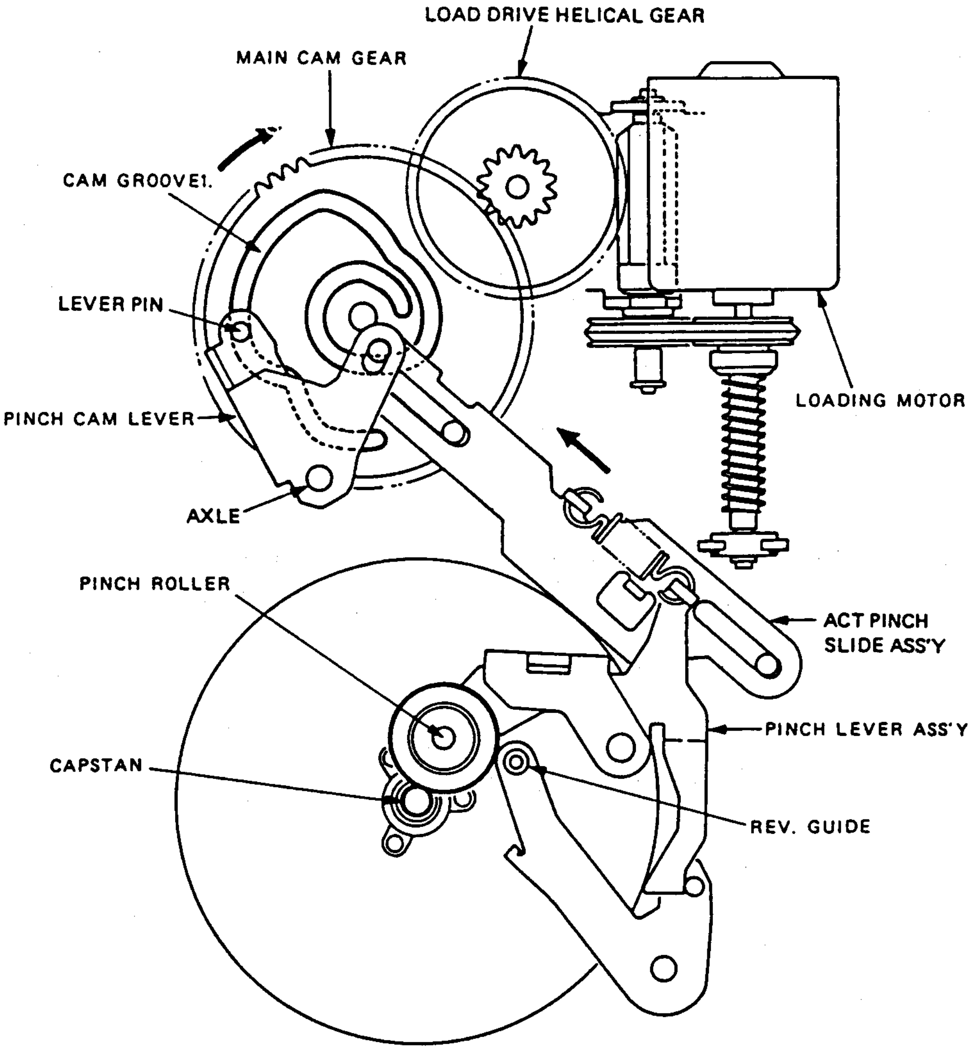

LOAD DRIVE HELICAL GEAR
MAIN CAM GEAR
CAM GROOVE1.
LEVER PIN
PINCH CAM LEVER
AXLE
PINCH ROLLER
CAPSTAN
LOADING MOTOR
ACT PINCH SLIDE ASS'Y
PINCH LEVER ASS'Y
REV. GUIDE

Fig. 2-6 CONSTRUCTION OF PINCH ROLLER MECHANISM

2-2-3. Operation of Brake Control Plate

The ACT SLIDE PLATE and the MAIN SLIDE PLATE shown in Fig. 2-7 is driven by the CAM GROOVE 4 of the MODE CAM GEAR for precise control of operations including the control of back tension lever, auxiliary brake (SUB BRAKE S/T), main brake (SUPPLY BRAKE and TAKE-UP BRAKE), clutch selection, FL END SWITCH selection, and drive selection of front loading mechanism.

Also, the mechanism mode switch is engaged with the small gear of the MODE CAM GEAR for sync rotation. At the time, the detection position of each mode is set so that it becomes the flat section at the cam curve of the CAM GROOVE 4 of the MODE CAM GEAR. So, even if motor stop time deviation occurs due to the load following the detection of the loading motor stop position, the control plate linked with a stop in the specified position.

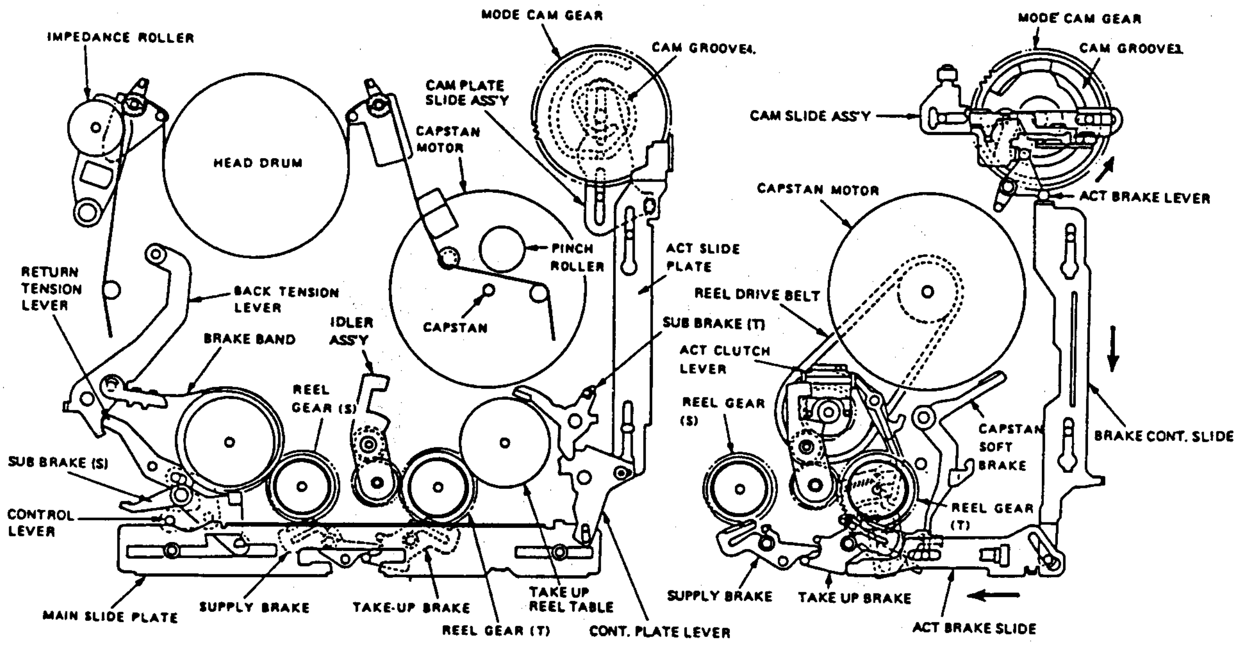

MODE CAM GEAR
IMPEDANCE ROLLER
CAM GROOVE4.
CAM PLATE SLIDE ASS'Y
CAPSTAN MOTOR
HEAD DRUM
PINCH ROLLER
RETURN TENSION LEVER
BACK TENSION LEVER
IDLER ASS'Y
CAPSTAN
BRAKE BAND
REEL GEAR (S)
SUB BRAKE (S)
CONTROL LEVER
MAIN SLIDE PLATE
SUPPLY BRAKE
TAKE-UP BRAKE
TAKE UP REEL TABLE
REEL GEAR (T)
CONT. PLATE LEVER
ACT SLIDE PLATE
REEL DRIVE BELT
SUB BRAKE (T)
ACT CLUTCH LEVER
REEL GEAR (S)
MODE CAM GEAR
CAM GROOVE1
CAM SLIDE ASS'Y
CAPSTAN MOTOR
ACT BRAKE LEVER
CAPSTAN SOFT BRAKE
BRAKE CONT. SLIDE
REEL GEAR (T)
SUPPLY BRAKE
TAKE UP BRAKE
ACT BRAKE SLIDE

Fig. 2-7 CONSTRUCTION OF BRAKE CONTROL PLATE (AT REW/FF, STOP MODE)

2-2-4. Brake Control Mechanism

The mechanical logic of the brake state is shown in Fig. 2-8. The brake which damps the reel rotation is operated by the BRAKE CONTROL SLIDE driven from the CAM GROOVE 3 of the MODE CAM GEAR.

Also, to alleviate damage to the tape caused by high tension of the brake in operation, the tape is stopped after brake operation and the shape is thoughtfully designed for proper biting-in ratio of the left and the right brakes after-mentioned to each other.
This enables the supply brake to be released by the operation of the above-mentioned MAIN SLIDE PLATE after an elapse of prefixed slight time to reduce the tape tension to zero, and to provide the tape with a proper degree of looseness. As a result, a slight gap is created in the tape from the HEAD DRUM.

Further, a momentary still mechanism which dispenses with use of a plunger solenoid is not provided as one of design features of the P-88 mechanism.
To stabilize the image in an extremely short period of time during a shift to the STILL mode from the PLAY mode, the auxiliary brake (CAPSTAN SOFT BRAKE) is press-fit to the outer circumference of the capstan motor by the before-mentioned CAM GROOVE 3 of the MODE CAM GEAR.
These operations is interlocked with the operation of the before-mentioned ACT SLIDE PLATE and the MAIN SLIDE PLATE. It consists of one MODE CAM for offsetting the operating position.

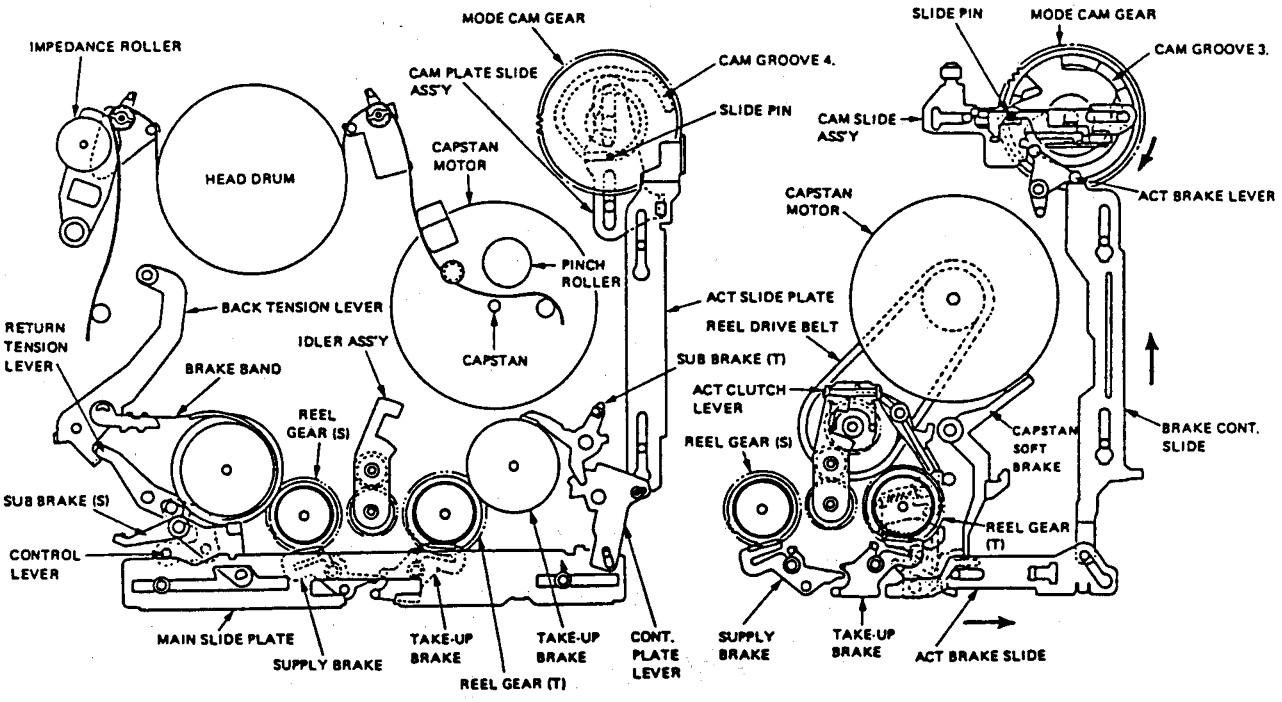

MODE CAM GEAR
IMPEDANCE ROLLER
CAM PLATE SLIDE ASS'Y
CAM GROOVE 4.
SLIDE PIN
CAPSTAN MOTOR
HEAD DRUM
PINCH ROLLER
BACK TENSION LEVER
RETURN TENSION LEVER
IDLER ASS'Y
CAPSTAN
BRAKE BAND
REEL GEAR (S)
SUB BRAKE (S)
CONTROL LEVER
MAIN SLIDE PLATE
SUPPLY BRAKE
TAKE-UP BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
CONT. PLATE LEVER
ACT SLIDE PLATE
REEL DRIVE BELT
SUB BRAKE (T)
ACT CLUTCH LEVER
REEL GEAR (S)
SLIDE PIN
MODE CAM GEAR
CAM GROOVE 3.
CAM SLIDE ASS'Y
CAPSTAN MOTOR
ACT BRAKE LEVER
CAPSTAN SOFT BRAKE
BRAKE CONT. SLIDE
REEL GEAR (T)
SUPPLY BRAKE
TAKE-UP BRAKE
ACT BRAKE SLIDE

Fig. 2-8 CONSTRUCTION OF BRAKE CONTROL PLATE (AT BRAKE MODE)

2-2-5. Brake Lock Release Mechanism (FF/REW→STOP Mode)

The brake lock momentary release mechanism is shown in Fig. 2-9 ⓐ, ⓑ and Fig. 2-10.
In the FF/REW mode (Fig. 2-9 ⓐ) mechanical elastic load is given to the BRAKE LOCK LEVER mounted on the BRAKE CAM SLIDE which causes the brake to operate, and it is locked to the high-speed rotary axle of the 1st reducing section of the loading motor.

ⓐChanges from brake mode or lock released state to FF/REW, STOP mode.

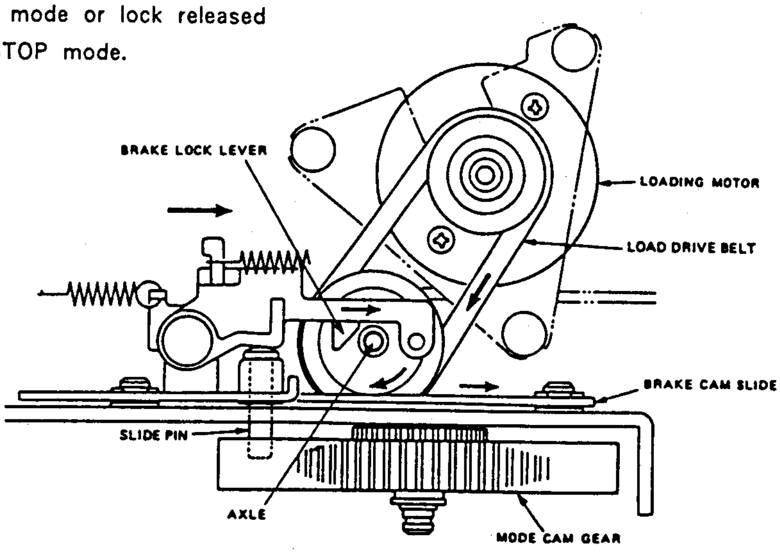

BRAKE LOCK LEVER
LOADING MOTOR
LOAD DRIVE BELT
BRAKE CAM SLIDE
SLIDE PIN
AXLE
MODE CAM GEAR

Fig. 2-9 ⓐ BRAKE LOCK & RELEASE MECHANISM

At the time of a shift to the STOP mode from the FF/REW (Fig. 2-9 ⓑ), the BRAKE LOCK LEVER releases the lock on slight rotation of the axle by contact between the rotary shaft and the friction resistance so that the brake can be instantaneously applied to the reel. The lock release speed is almost the same as the start-up of the loading motor. So, the its response to the brake is very quick, and construction is simplified also.

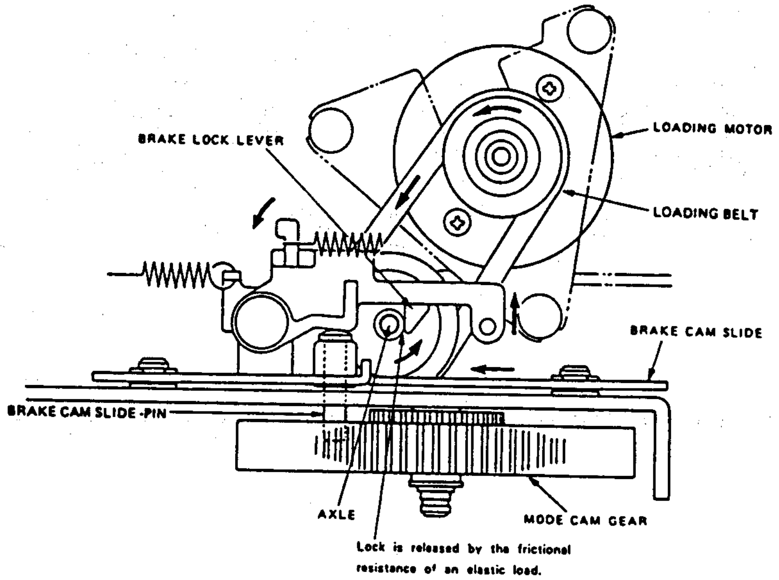

BRAKE LOCK LEVER
LOADING MOTOR
LOADING BELT
BRAKE CAM SLIDE
BRAKE CAM SLIDE-PIN
AXLE
MODE CAM GEAR
Lock is released by the frictional resistance of an elastic load.

Fig. 2-9 ⓑ BRAKE LOCK & RELEASE MECHANISM

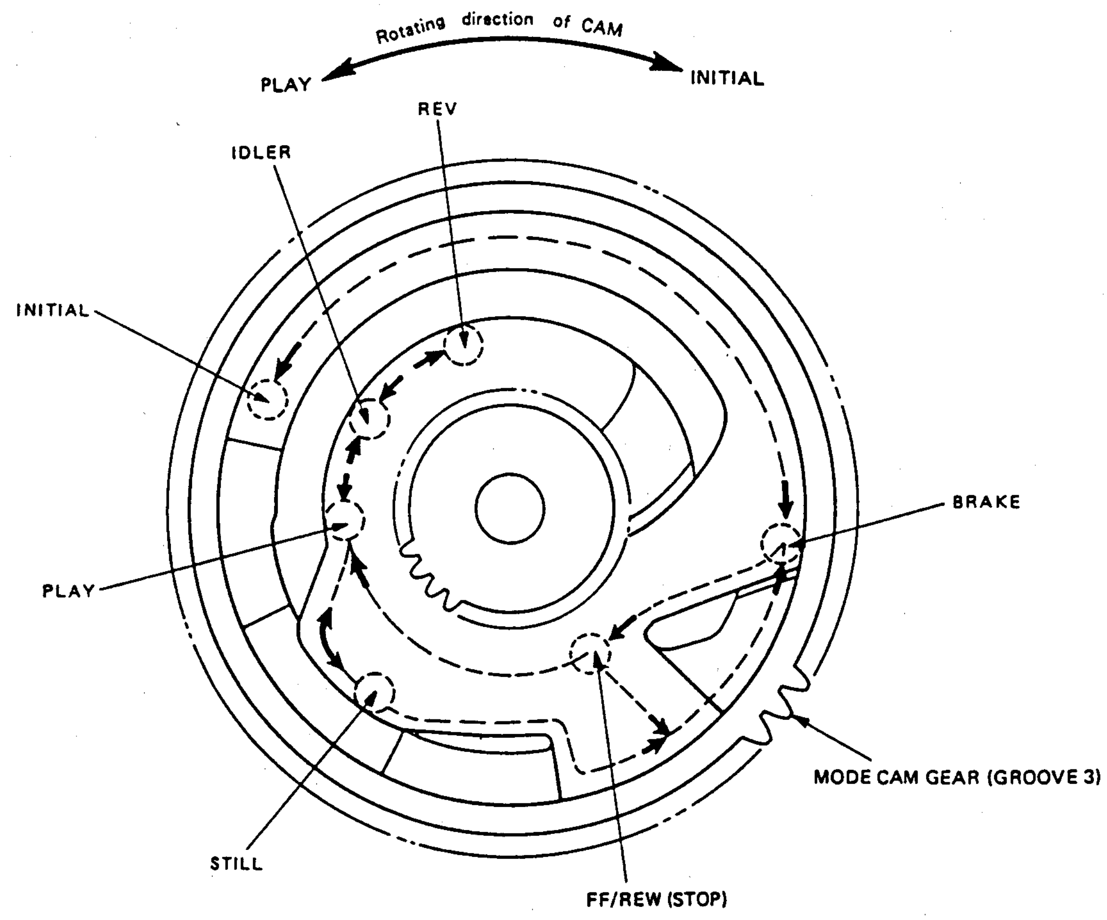

Rotating direction of CAM
PLAY
INITIAL
REV
IDLER
INITIAL
BRAKE
PLAY
MODE CAM GEAR (GROOVE 3)
STILL
FF/REW (STOP)

Fig. 2-10 POSITIONING OF BRAKE CAM SLIDE-PIN ON THE GROOVE 3 OF MODE CAM GEAR

2-3. REEL TABLE DRIVE

2-3-1. Reel Table Drive Mechanism

This mechanism employs the system of driving the tape from the DD capstan motor via rubber belt. In the tape constant speed running mode for PLAY, F-SEARCH, and R-SEARCH, the capstan and the pinch roller are press-fitted to allow the tape to run at a constant speed. By providing a FRICTION MECHANISM in between the capstan motor and the reel table, the tape is taken up. In the FF/REW tape high-speed take-up mode, the capstan and the pinch roller are separated from each other, and the capstan motor and the reel table are linked direct by the clutch mechanism to carry out tape take-up. Also, to realize a thin type reel table drive section, the mechanism is simplified and the rotary parts are thinned for realization of physically compact design, and a step is provided on the reel table mounting section of the chassis by high-precision drawing process. A simplified figure of the drive mechanism is shown in Fig. 2-11 and Fig. 2-12. Power transmission to the pulley of the clutch mechanism section is done from the DD capstan motor via rubber belt.

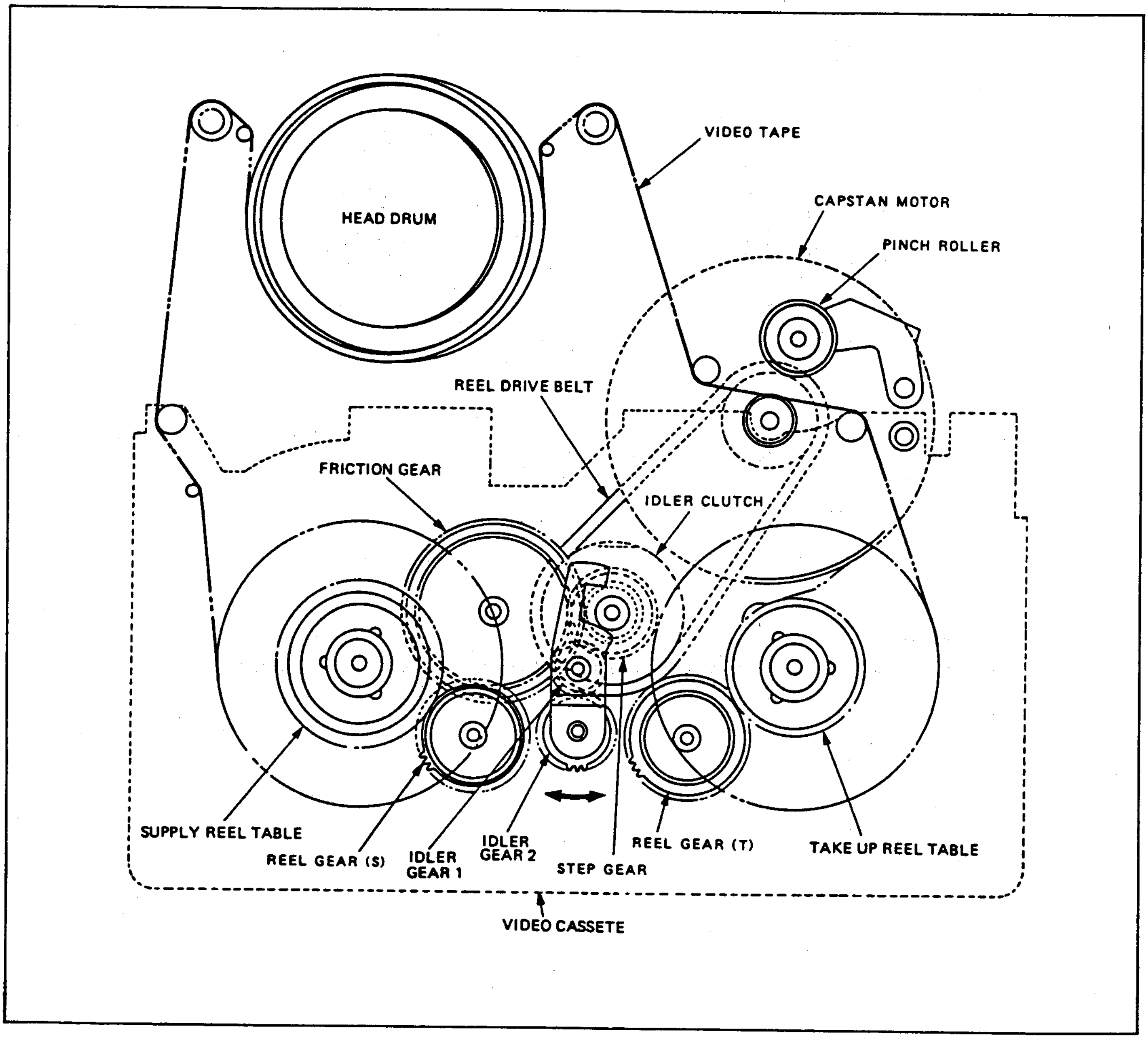
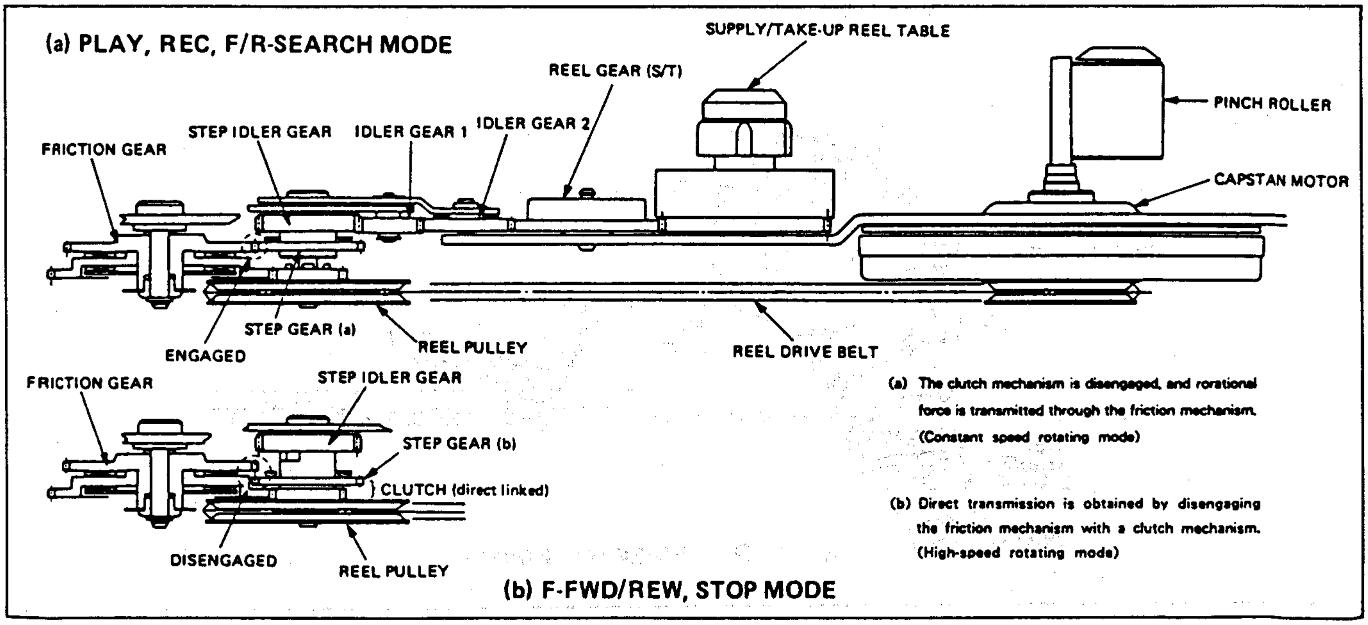

HEAD DRUM
VIDEO TAPE
CAPSTAN MOTOR
PINCH ROLLER
REEL DRIVE BELT
FRICTION GEAR
IDLER CLUTCH
SUPPLY REEL TABLE
REEL GEAR (S)
IDLER GEAR 1
IDLER GEAR 2
STEP GEAR
REEL GEAR (T)
TAKE UP REEL TABLE
VIDEO CASSETE

Fig. 2-11 REEL TABLE DRIVE

At that time, the reel table winding speed and the torque needed in a wide variety of modes are obtained by shifting the up and down STEP GEAR positioned at the upper section of pulley. The selection of the STEP GEAR is precision controlled by the MODE CAM GEAR via the BRAKE CONTROL SLIDE. With the up and down STEP GEAR down, the clutch mechanism is direct linked, and the transmission power from the capstan motor is sent to the reel table via IDLER GEAR assembly and REEL GEAR (S/T). On the other hand, FRICTION MECHANISM acts between the pulley and the STEP GEAR when the up and down STEP GEAR are in the elevated state, thereby controlling the transmission torque for generation of the take-up slip. Normally, it is desirable that the take-up torque of the reel table is higher in the R-SEARCH mode than that in the PLAY mode. This is because in the forward tape running the tape winding load to the HEAD DRUM has to be taken care of the capstan and the pinch roller.
While, in the reverse tape running mode the winding load has to be taken on the take-up reel table. In the special playback operation, a mechanism for varying the take-up torque of the reel table is required to be changed depending upon the running direction of the tape. But in this mechanism, the torque selection is made by varying the reduction speed ratio up to the reel table from the capstan motor on both the forward side and the reverse side of the tape. Also, design simplification of the selection mechanism is realized by using a single friction mechanism. In other words, the take-up torque necessary for forward/reverse rotation is obtained by controlling the capstan motor speed.

Rotation speed and torque needed for each mode of operation are converted by clutch mechanism for transmission of the drive power to the idler mechanism. The left and right moving IDLER GEAR assembly is automatically rotated to the left and the right according to the direction of capstan motor rotation by using the friction force. Because the mechanism is so designed as to drive the reel table of the side on which the tape is transported by the capstan and pinch roller, the forward and reverse constant speed drive (the PLAY, REC, F/R SEARCH modes) is carried out in the state in which the FRICTION MECHANISM is being operated (Fig. 2-12 ⓐ) On the other hand, in the condition in which the friction mechanism is not in operation, the forward/reverse high speed drive (FF/REW mode) is made possible (Fig. 2-12 ⓑ). Also, the reel drive in all modes is taken care of by the single left and right moving idler for design simplification.

The idler body employs gear drive to improve reliability with a view to realizing parts thinning while securing the transmission reliability. Using a resin molded gear as material of an idler, the efficiency of the entire reel drive system has been improved because there are no deformation and loss, and minimized rotation moving torque necessary for biting-in as in the case of a material such as rubber which shows considerable elastic deformation, etc. Further in this mechanism, an intermediate gear is provided in between the reel side and the idler to minimize the rotating and moving angle of the left and right moving idlers, thereby holding the reversing time to a minimum when shifting to the tape running direction change mode. This results in significantly reduced possibility of tape looseness.


(a) PLAY, REC, F/R-SEARCH MODE

(b) F-FWD/REW, STOP MODE

(a) The clutch mechanism is disengaged, and rorational force is transmitted through the friction mechanism. (Constant speed rotating mode)

(b) Direct transmission is obtained by disengaging the friction mechanism with a clutch mechanism. (High-speed rotating mode)

Fig. 2-12 REEL TABLE DRIVE (SIDE VIEW)

2-3-2. Reel Table Drive Clutch Lock and Release Mechanism

As described in the preceding section, using the selection of the step gear (CLUTCH MECHANISM), two mechanisms which are driven by being selected via direct drive or via FRICTION MECHANISM from the capstan motor, to execute the reel table drive. The operating status of the clutch lock and the releasing mechanism is shown in Fig. 2-13.

Fig. 2-13 ① shows the tape unloading position (INITIAL position) when the power for the mechanism operating mode is switched off.

At that times all the levers are in the initial positions, and the clutch is released also so that a route for reel table drive is created via a friction mechanism.

Fig. 2-13 ② shows that the mechanism operation mode has executed the tape loading and that it has completed its movement to the STOP (stand-by), FF/REW position.

At this time, the CLUTCH ACT LEVER is operated by the hook of the ACT BRAKE SLIDE to move the ACT CLUTCH LEVER in the direction of arrow via the CLUTCH LEVER and the CLUTCH CHANGE LEVER. Now, the up and down STEP GEAR is placed into the direct coupled state. In the FF/REW mode, the reel table is directly driven so that the rotation of the capstan motor is directly transmitted to make high-speed rotation drive possible. When shifting the mode to the STOP from the FF/REW in this condition, the mechanism mode position is once moved back to the brake position, and when the reel table brake is instantaneously applied, the clutch is released once at the same time, after which it returns to the same mechanism mode as the FF/REW mode once again. Now, it is placed in a waiting state in the same condition of the STOP mode as shown in Fig. 2-13 ②.

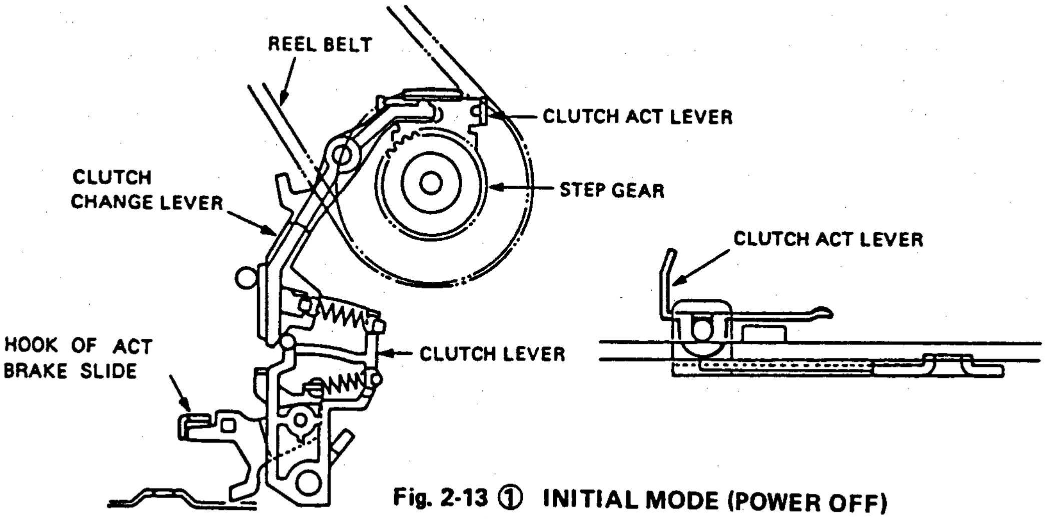
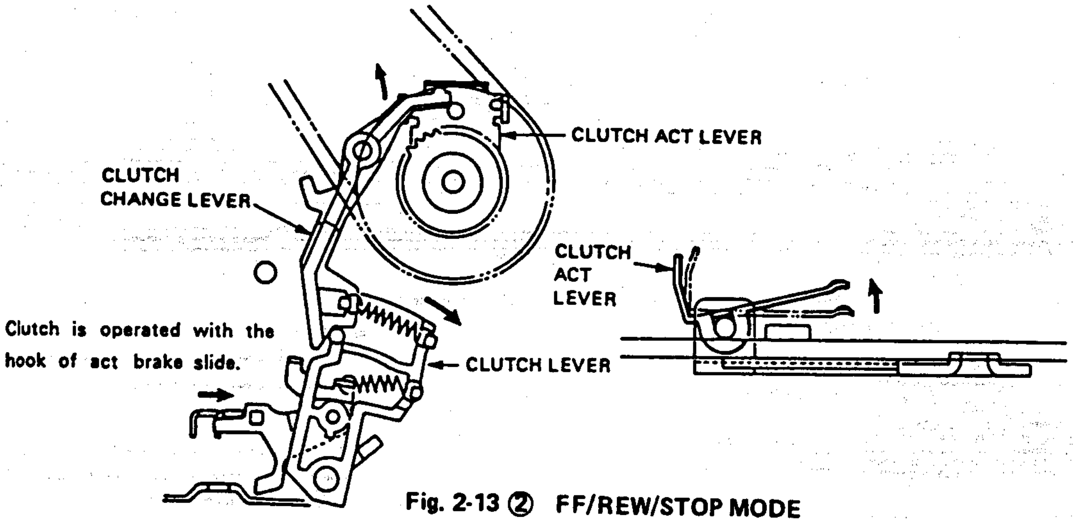


Fig. 2-13 ① INITIAL MODE (POWER OFF)



Clutch is operated with the hook of act brake slide.

Fig. 2-13 ② FF/REW/STOP MODE

Fig. 2-13 ① – ③ REEL TABLE DRIVE CLUTCH LOCK AND RELEASE MECHANISM

Fig. 2-13 ③ shows the completion state of a shift to the PLAY mode via the STILL mode from the STOP (FF/REW) mode for the mechanism mode position.
In the case of this mode shifting, the movement of the BRAKE ACT SLIDE remains fixed. So, the CLUTCH ACT LEVER should be unlocked by the movement of the hook of the MAIN SLIDE PLATE to cause the clutch to be released. This movement in turn causes the capstan motor rotation to be transmitted via the friction mechanism. So, the constant speed rotation drive necessary for the PLAY (REC) mode and SEARCH mode is made possible.

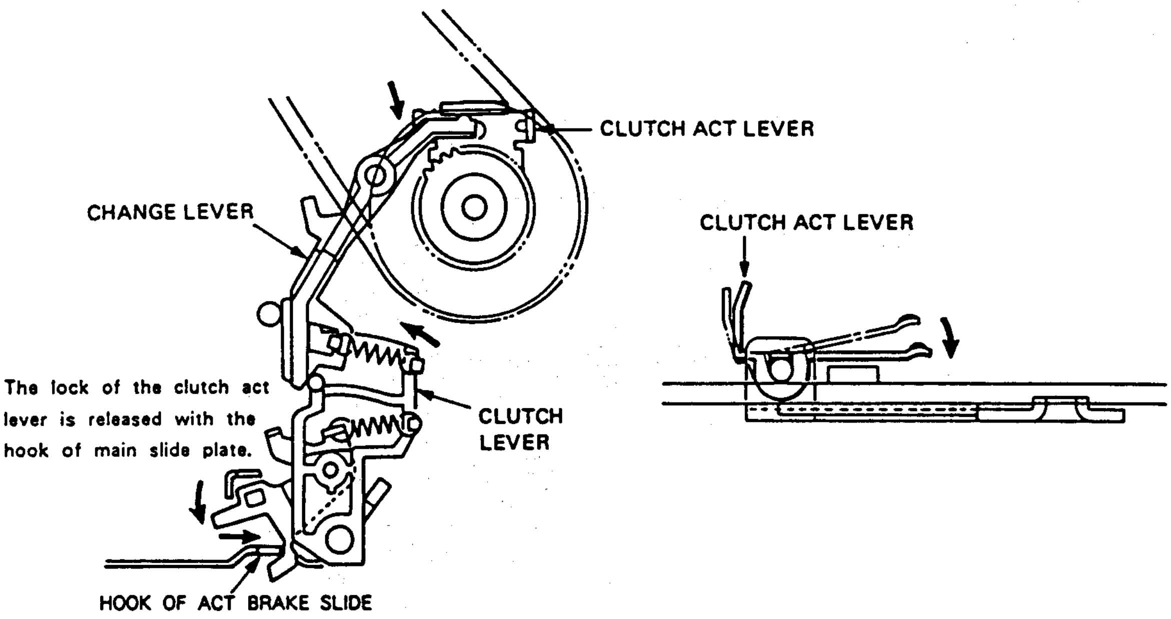

CLUTCH ACT LEVER
CHANGE LEVER
CLUTCH ACT LEVER
The lock of the clutch act lever is released with the hook of main slide plate.
CLUTCH LEVER
HOOK OF ACT BRAKE SLIDE

Fig. 2-13 ③ FF/REW/STOP MODE → STILL MODE → PLAY MODE

2-4. FRONT LOADING DRIVE SELECTION MECHANISM

In the P-88 mechanism, the motor dedicated to the use of front loading is not employed. The drive source is utilized instead of the tape loading motor. As shown in Fig. 2-14 ⓐ/ⓑ, during the front loading the FRONT LOAD WORM GEAR directly coupled to the tape loading motor axle and the FRONT HELICAL GEAR with several teeth missing are engaged with each other and rotated for transmission of the drive force to the front loading mechanism. When the cassette tape is inserted completely in the mechanism, the FRONT HELICAL GEAR is automatically disengaged from the FRONT LOAD WORM GEAR. After that, the tape loading operation is performed without the tape loading motor drive force being transmitted to the front loading mechanism.

While the drive force is being transmitted to the front loading mechanism, the CAM GROOVEs of the before-mentioned MAIN CAM GEAR and the MODE CAM GEAR are flat in cam line pattern. These are therefore held without changing the mode state of the mechanism in any way.

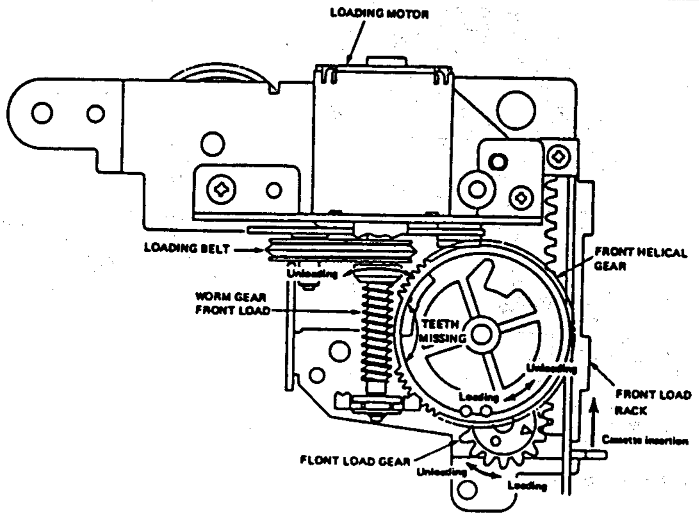

LOADING MOTOR
LOADING BELT
Unloading
WORM GEAR FRONT LOAD
TEETH MISSING
FRONT HELICAL GEAR
Unloading
Loading
FRONT LOAD RACK
Cassette insertion
FLONT LOAD GEAR
Unloading
Loading

Fig. 2-14 ⓐ FRONT LOADING DRIVE SELECTION MECHANISM (CASSETTE INSERTED POSITION)

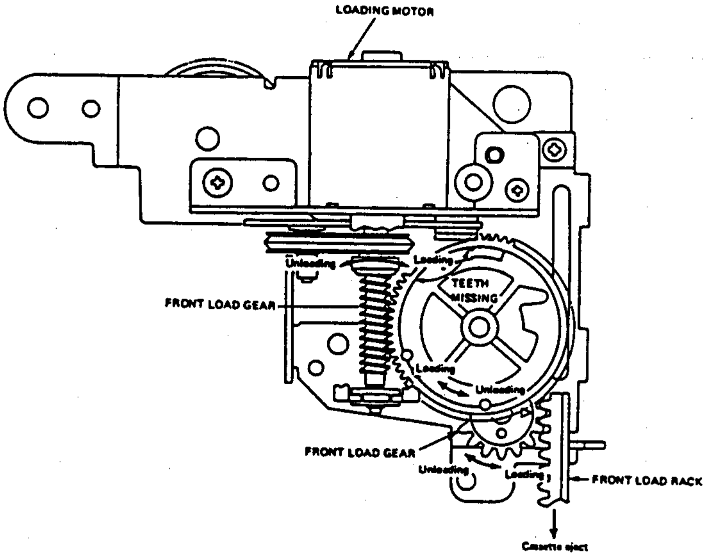

LOADING MOTOR
Unloading
Loading
TEETH MISSING
FRONT LOAD GEAR
Loading
Unloading
FRONT LOAD GEAR
Unloading
Loading
FRONT LOAD RACK
Cassette eject

Fig. 2-14 ⓑ FRONT LOADING DRIVE SELECTION MECHANISM (CASSETTE EJECTED POSITION)

(A) Cassette inserting operation

When inserting a cassette from the cassette ejected state of Fig. 2-14 ⓑ, the FL START SWITCH shown in Fig. 2-15 is turned OFF, to cause the loading motor to be rotated in the direction of insetting. As a result, the FRONT LOAD RACK is drawn in, and the front loading is made up to the cassette tape completion point. So, it is locked in the grooves shown in Fig. 2-15 to complete cassette inserting. At that time, the FRONT HELICAL GEAR is positioned at ⓐ of Fig. 2-14, and is released from the front loading mechanism, therefore, the tape loading operation is continuously performed.

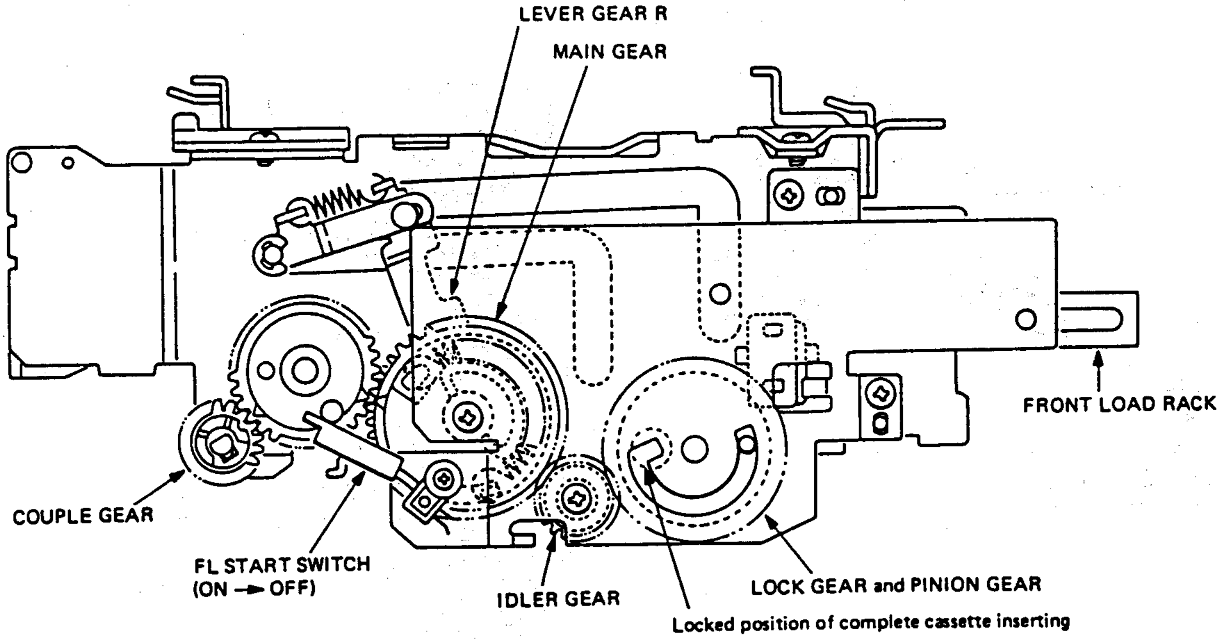

LEVER GEAR R
MAIN GEAR
FRONT LOAD RACK
COUPLE GEAR
FL START SWITCH
(ON → OFF)
IDLER GEAR
LOCK GEAR and PINION GEAR
Locked position of complete cassette inserting

Fig. 2-15 CASSETTE HOLDER MECHANISM (CASSETTE INSERTING OPERATION)

(B) Cassette ejection operation

The components of the front loading mechanism is shown in Fig. 2-16.

When ejecting the cassette from the inserted state shown in Fig. 2-14 ⓐ, the FRONT ACT LEVER is pushed in the direction of arrow due to the ACT SLIDE PLATE moves in the direction of arrow shown in Fig. 2-17. As a result, the FRONT LEVER assembly is turned counterclockwise via the FRONT LOAD SLIDE to cause the FRONT HELICAL GEAR to be engaged with the FRONT LOAD WORM GEAR of the loading motor. At that time, the loading motor is being rotated counterclockwise, so that the FRONT HELICAL GEAR is caused to be rotated counterclockwise also to carry out the front unloading via the FRONT LOAD GEAR and the FRONT LOAD RACK. At the same time, the FRONT ACT LEVER is operated counterclockwise by the hook of the FRONT HELICAL GEAR. This releases the lock being pushed in the direction of arrow indicated by the ACT SLIDE PLATE. So, the FRONT LOAD SLIDE assembly now moves to the initial position to prepare for the next ejection operation. Incidentally, the movement of the FRONT LEVER assembly performs an important function of positioning the FRONT HELICAL GEAR (Fig. 2-14 ⓐ) upon completion of cassette mounting, in addition to the cassette eject start-up operation.

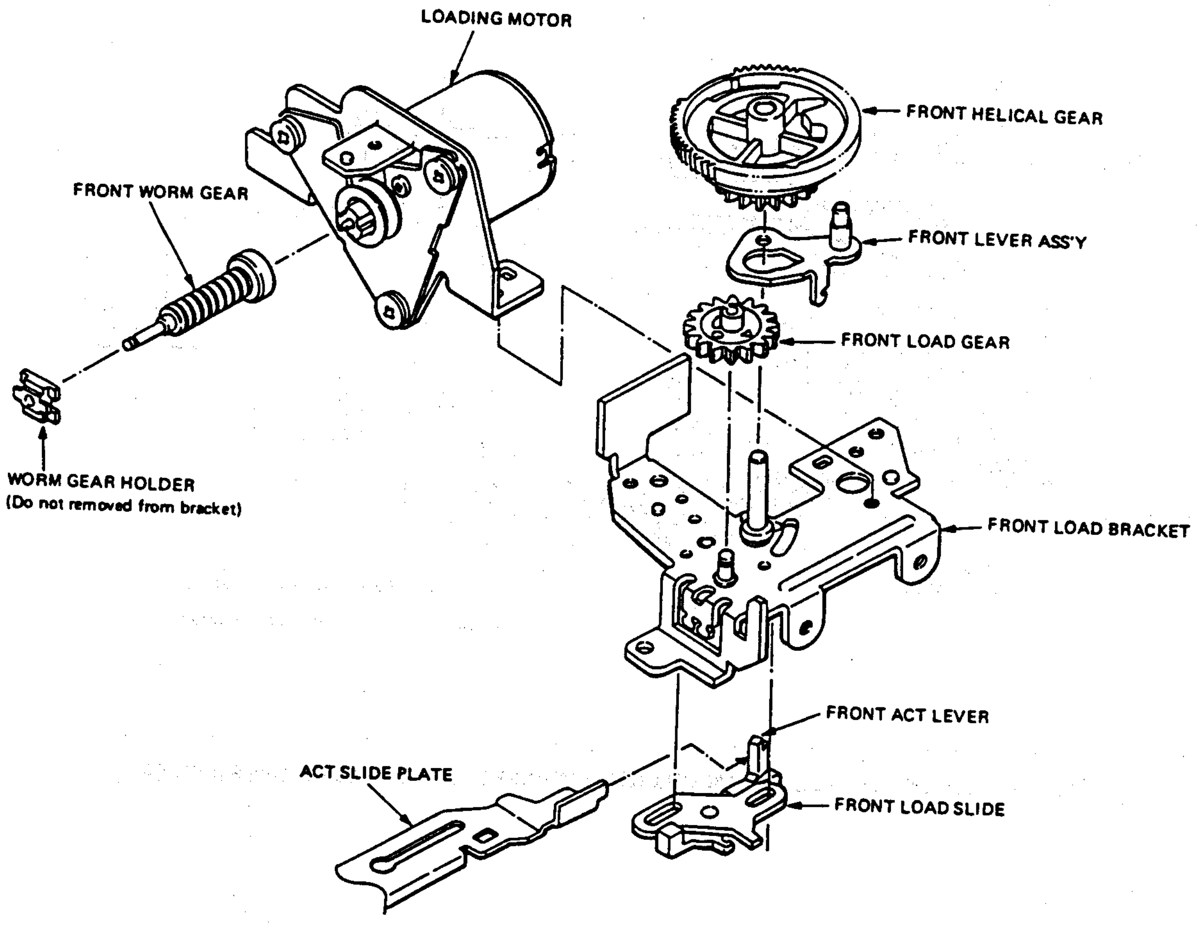
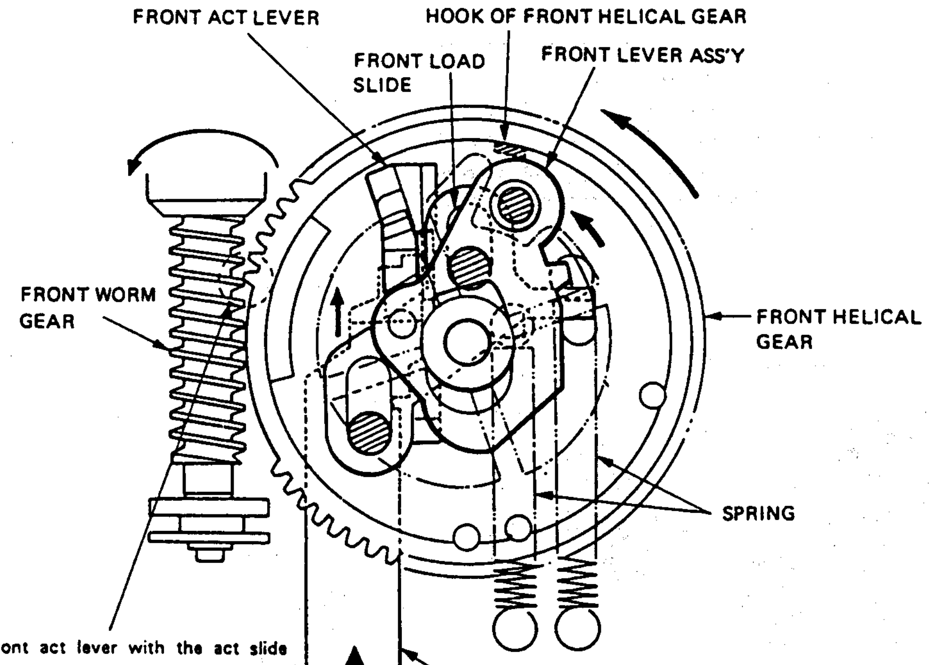

LOADING MOTOR
FRONT HELICAL GEAR
FRONT WORM GEAR
FRONT LEVER ASS'Y
FRONT LOAD GEAR
WORM GEAR HOLDER
(Do not removed from bracket)
FRONT LOAD BRACKET
FRONT ACT LEVER
ACT SLIDE PLATE
FRONT LOAD SLIDE

Fig. 2-16 FRONT LOADING DRIVE SELECTION MECHANISM


FRONT ACT LEVER
HOOK OF FRONT HELICAL GEAR
FRONT LOAD SLIDE
FRONT LEVER ASS'Y
FRONT WORM GEAR
FRONT HELICAL GEAR
SPRING
ACT SLIDE PLATE

By pressing the front act lever with the act slide plate, the front worm gear is engaged with the front helical gear, and starts the operarion to eject the cassette.

Fig. 2-17 CASSETTE EJECTION START OPERATION (See through top view)

2-5. CASSETTE HOLDER MECHANISM

2-5-1. Components

The exploded view of the cassette holder mechanism is shown in Fig. 2-18. This mechanism consists of a cassette tray for feeding the cassette tape to the specified position of the mechanism chassis, a side plate provided with L type holes for supporting and guiding it, the top plate for regulating the width of left and right, and a group of gears for driving the cassette tray.

The entire mechanism is of independent construction apart from the mechanism body. The holder is fixed on the mechanism chassis by inserting the pawls at two points and tightening the setscrews at two points, or at a total of four points.

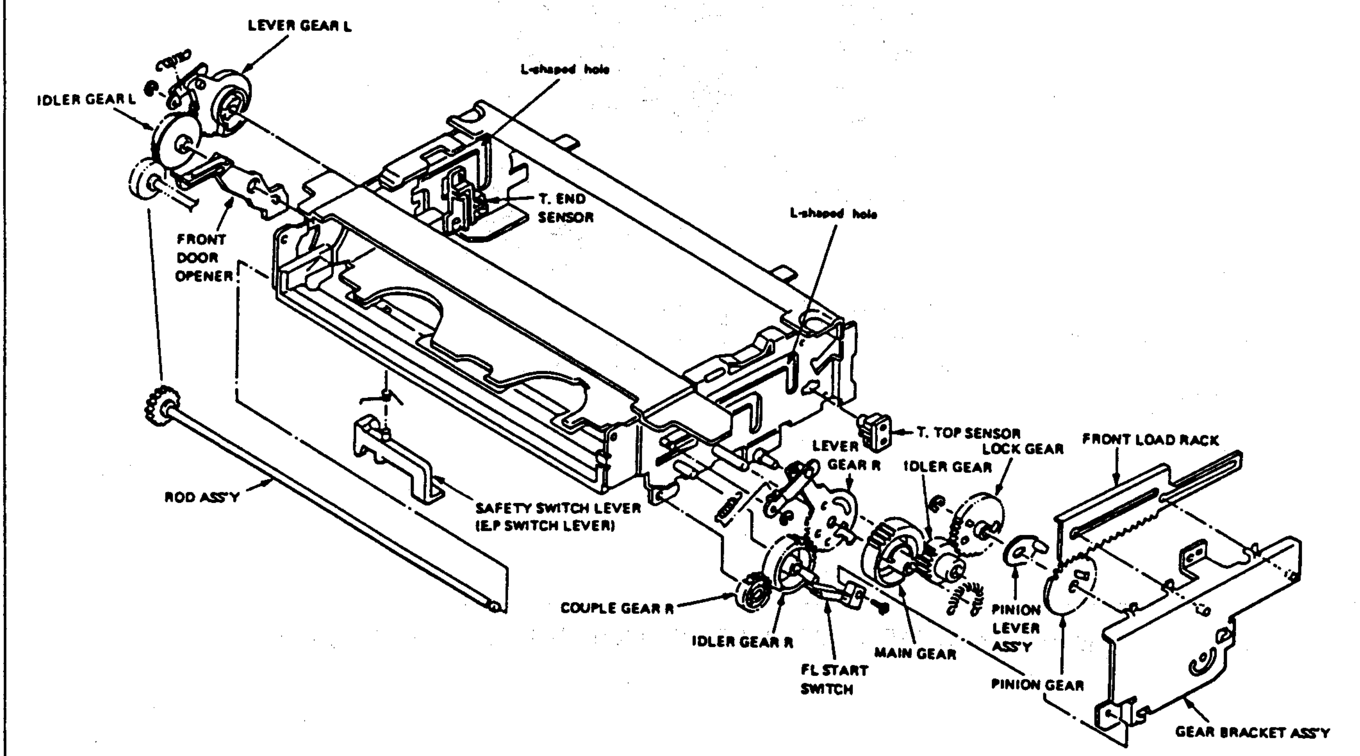

LEVER GEAR L
IDLER GEAR L
L-shaped hole
T. END SENSOR
L-shaped hole
FRONT DOOR OPENER
ROD ASS'Y
SAFETY SWITCH LEVER (E.P SWITCH LEVER)
T. TOP SENSOR
LOCK GEAR
FRONT LOAD RACK
LEVER GEAR R
IDLER GEAR
COUPLE GEAR R
IDLER GEAR R
FL START SWITCH
MAIN GEAR
PINION LEVER ASS'Y
PINION GEAR
GEAR BRACKET ASS'Y

Fig. 2-18 EXPLODED VIEW OF THE CASSETTE HOLDER MECHANISM

2-5-2. Description of Cassette Holder

The cassette holder is of motor-less design, as the lowering of mechanism height and driving source are done by the loading motor of the mechanism body.

As a substitute for the worm gear system hitherto used in the major drive section for the drive selection mechanism mentioned in section 2-4., the RACK LOADING system is adopted in this cassette holder mechanism. By this mechanism the motor-less design can be realized. An exploded view of the mechanism is shown in Fig. 2-19. A description of the operation is made below along with Fig. 2-19.

To press-fit the cassette tape after sending it onto the mechanism chassis, the PINION GEAR section is triple construction. The FRONT LOAD RACK side and the IDLER GEAR side are independently engaged. The PINION GEAR and the LOCK GEAR are connected from the PINION LEVER PIN riveted to the PINION LEVER. Even after feeding the cassette tape to the specified position of the mechanism chassis, the FRONT LOAD RACK slides, giving the rotation to the PINION GEAR which is engaged with the FRONT LOAD RACK. At that time, a pin is dropped into the groove section provided on the GEAR BRACKET ASS'Y.

The other LOCK GEAR is fixed by this PINION LEVER PIN, and the cassette tape is press-fitted onto the mechanism chassis by linked IDLER GEAR. The before-mentioned FRONT LOAD RACK and the PINION GEAR are set free after dropping the PINION LEVER PIN into the groove section. So, the drive force of the loading motor is sent to the mechanism body.

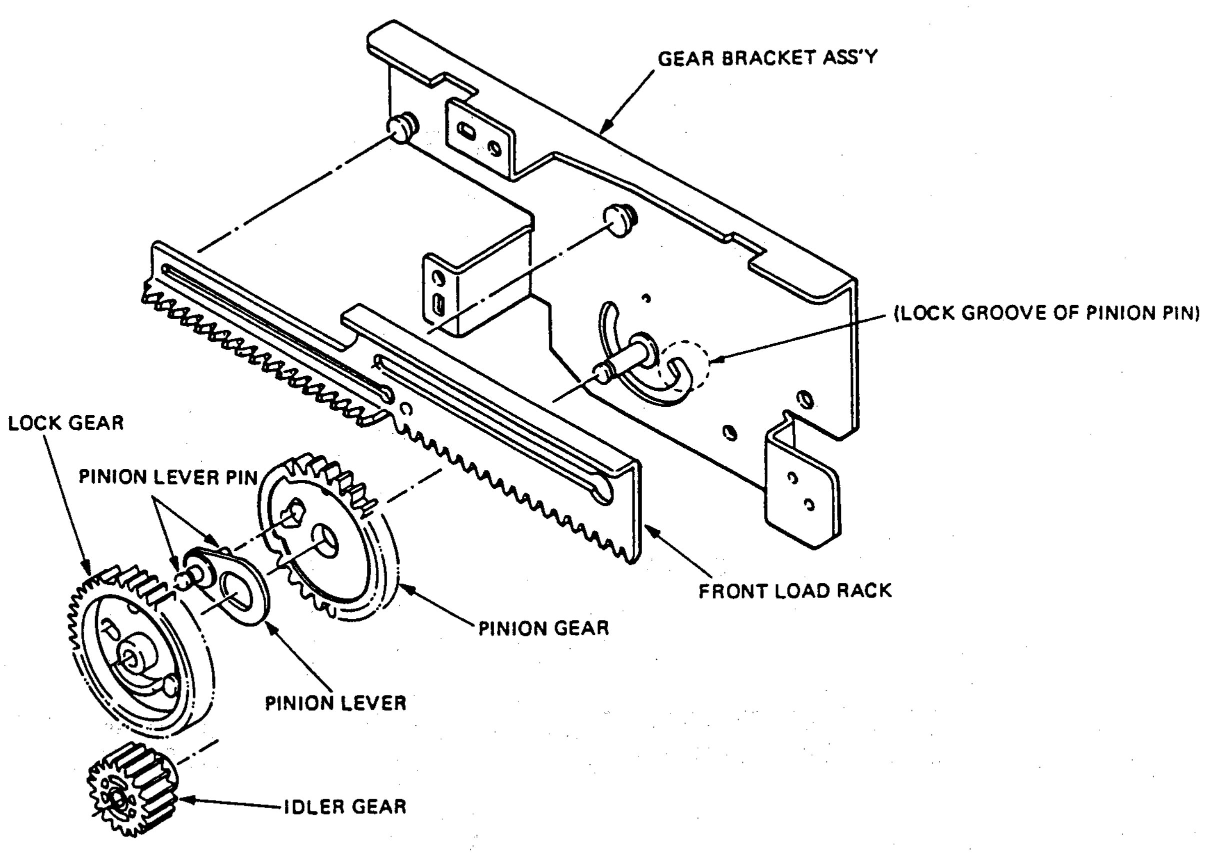


Fig. 2-19 RACK LOADING MECHANISM OF CASSETTE HOLDER

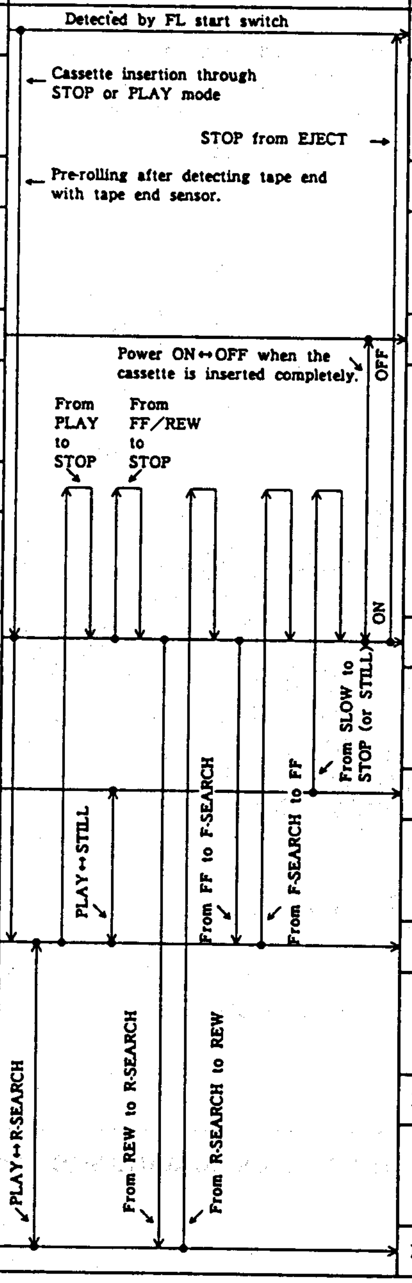
3. MECHANISM CONTROL

3-1. MODE ARRANGEMENT

This mechanism is arranged in such a mode layout as shown in Table. 3-1 and as described in section 2-1. The mode sensing switch described below is used for control of these modes.

3-2. MODE DETECTION SWITCH

For mode detecting two leaf switches (FL START SWITCH and FL END SWITCH), and one rotary switch (MECHANISM MODE SWITCH) are used in combination.

Mechanism Mode	Mechanism Mode Switch 3	2	1	HEX DATA	Function	Main Mode Shifting Conditions	VTR Operation Mode
EJECT	-	-	-		Eject position		EJECT
					Front loading/Unloading		
SHORT REW	-	-	-		Take up operation in the tape end position		Detected by FL END switch
INITIAL	1	1	1	⑦	Power off position		Power off when tape is loaded completely
					Tape unloading position Tape loading Tape loading ending position		
BRAKE	0	0	1	①	Main brake applying position		
STOP / FF/REW	0	1	0	②	STOP waiting and FF/REW (the head motor rotation)		STOP, FF/REW
STILL	0	1	1	③	The positions of STILL, SLOW or F-ADV.		STILL, SLOW, F-ADV
PLAY	1	0	0	④	From FWD direction Normal running mode		PLAY, REC, F-SEARCH
IDLER	1	0	1	⑤	Forward/reverse changeover position		PAUSE
REV	1	1	0	⑥	From REV direction Normal running mode		R-SERACH

Detected by FL start switch
Cassette insertion through STOP or PLAY mode
STOP from EJECT
Pre-rolling after detecting tape end with tape end sensor.
Power ON↔OFF when the cassette is inserted completely.
OFF
ON
From PLAY to STOP
From FF/REW to STOP
From SLOW to STOP (or STILL)
PLAY↔STILL
From FF to F-SEARCH
From F-SEARCH to FF
PLAY↔R-SEARCH
From REW to R-SEARCH
From R-SEARCH to REW

Table 3-1

(1) Switch component
The mode switch consists of FL START SWITCH for detecting the cassette ejection and insertion, FL END SWITCH for detecting the cassette complete insertion position, that is short rewind position, and MECHANISM MODE SWITCH for detecting the each mode position of the mechanism. As can be understood from Fig. 3-1, the MECHANISM MODE SWITCH rotates in excess of 360 degrees. Therefore, the sensing of a signal from the MECHANISM MODE SWITCH is done by the leaf switch 2.

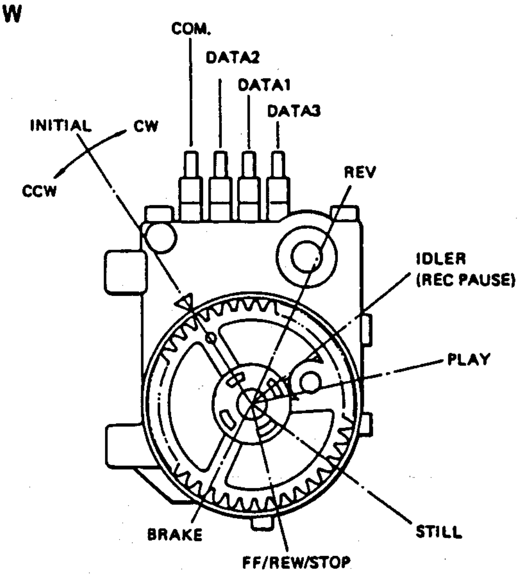
(2) Mechanism mode switch
The mechanism mode switch consists of four terminals, namely, COM, DATA1, DATA2, and DATA3. These are processed as 3-bit signals for discrimination of seven modes.

3-3. CONSIDERATION TO FULL LOADING

① In the normal stop condition, the head drum is rotated to facilitate the start-up of the image at the time of playback, but it is conceivable that this is left undisturbed for an extended period of time. This may result in wear of the video head. For this reason, when five minutes elapse from the stop condition, the head drum stops rotating.

② To prevent the tape from being caught in the head drum due to dew forming, etc., the tape is housed in the unloaded cassette when turning the power off.

A. EXPLODED VIEW


COM.
DATA2
DATA1
DATA3
INITIAL
CW
CCW
REV
IDLER
(REC PAUSE)
PLAY
BRAKE
STILL
FF/REW/STOP

B. CONSTRUCTION OF INSIDE SWITCH

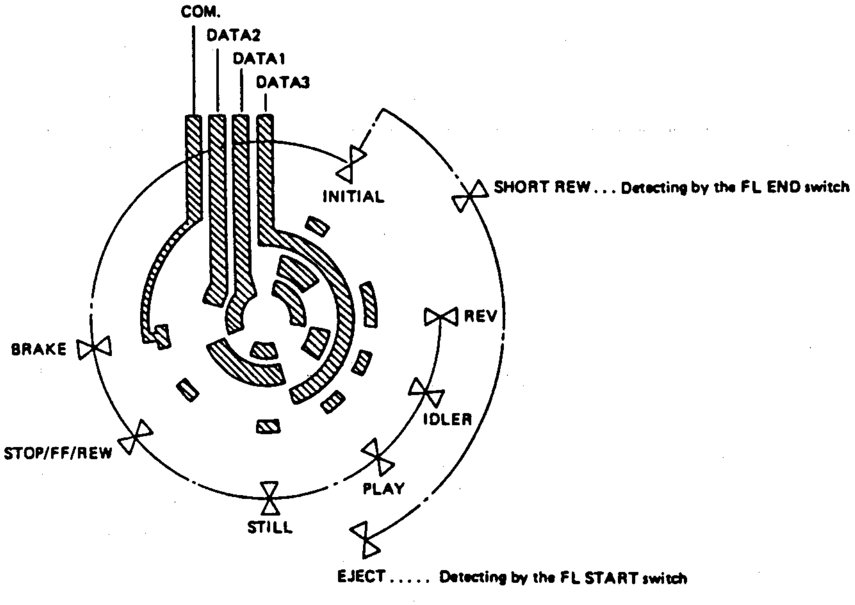

COM.
DATA2
DATA1
DATA3
INITIAL
SHORT REW... Detecting by the FL END switch
REV
BRAKE
IDLER
STOP/FF/REW
PLAY
STILL
EJECT..... Detecting by the FL START switch

Fig. 3-1 MECHANISM MODE SWITCH (ROTARY SWITCH)

4. MECHANISM MAINTENANCE AND CHECKING

4-1. PERIODIC CHECKING AND MAINTENANCE ITEMS AND SERVICE JIGS

The following maintenance and periodic checking procedures are recommended to ensure proper operation, and to protect the tape from dirt and damage. Also, these procedures should always be followed after repairing the unit.

4-1-1. Periodic Check Items

○ Cleaning ◎ Confirmation △ Lubrication

Part	Usage Time (hours)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape Guide System	Tape running surfaces	○	○	○	○	○	○	○	○	○	○	
	ACE head	○	○	○	○	○	○	○	○	○	○	
	Drum (cylinder)	○	○	○	○	○	○	○	○	○	○	Head life depends heavily on operating conditions.
Drive System	Loading belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Reel drive belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Intermediate gear, pulley axles		△		△		△		△		△	Absolutely avoid oil on tape running surfaces.
	Capstan axles		△		△		△		△		△	
	Loading motor		◎		◎		◎		◎		◎	
Performance Check	Back tension torque		◎		◎		◎		◎		◎	42 ± 5gcm
	Brake system		◎		◎		◎		◎		◎	
	FWD, REW, PLAY torque		◎		◎		◎		◎		◎	FWD, REW : 800gcm and over PLAY (SP) : 80 to 150gcm

4-1-2. Cleaning

① Drum (COMPL CYLINDER) and Video Heads (See Fig. 4-1-1.)

1) Wrap a chamois leather around your finger and moisten it with methyl alcohol.
2) Move the chamois leather to left and right several times on the video head to clean. There is a video head also on the opposite side, so clean it likewise. In Hi-Fi models, clean the audio head also.
3) Clean the tape path surface of the cylinder in the same way.

Note : Always turn power off before cleaning. Do never move the chamois leather vertically or apply too much force to the head ; it may be damaged.

② Cleaning of the Tape Guide System (See Fig. 4-1-2.)

1) Set the EJECT mode and clean the tape guide system (tape guides, impedance roller, FTE head, ACE head, pinch rollers, capstan axles, etc.) with a chamois leather moistened with methyl alcohol.

Note : Make sure that no oil, grease, etc. adhere to the chamois leather and that heads are not damaged.

③ Cleaning of the Drive System

1) Clean the drive system (loading belt, reel drive belt, pulley, supply reel table, etc.) with a soft cloth moistened with methyl alcohol.

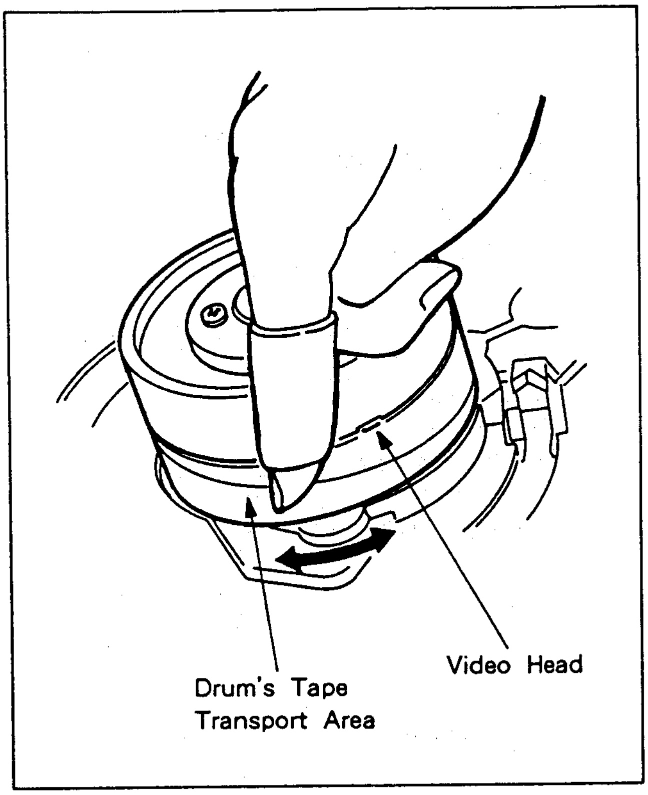

Video Head
Drum's Tape Transport Area

Fig. 4-1-1.

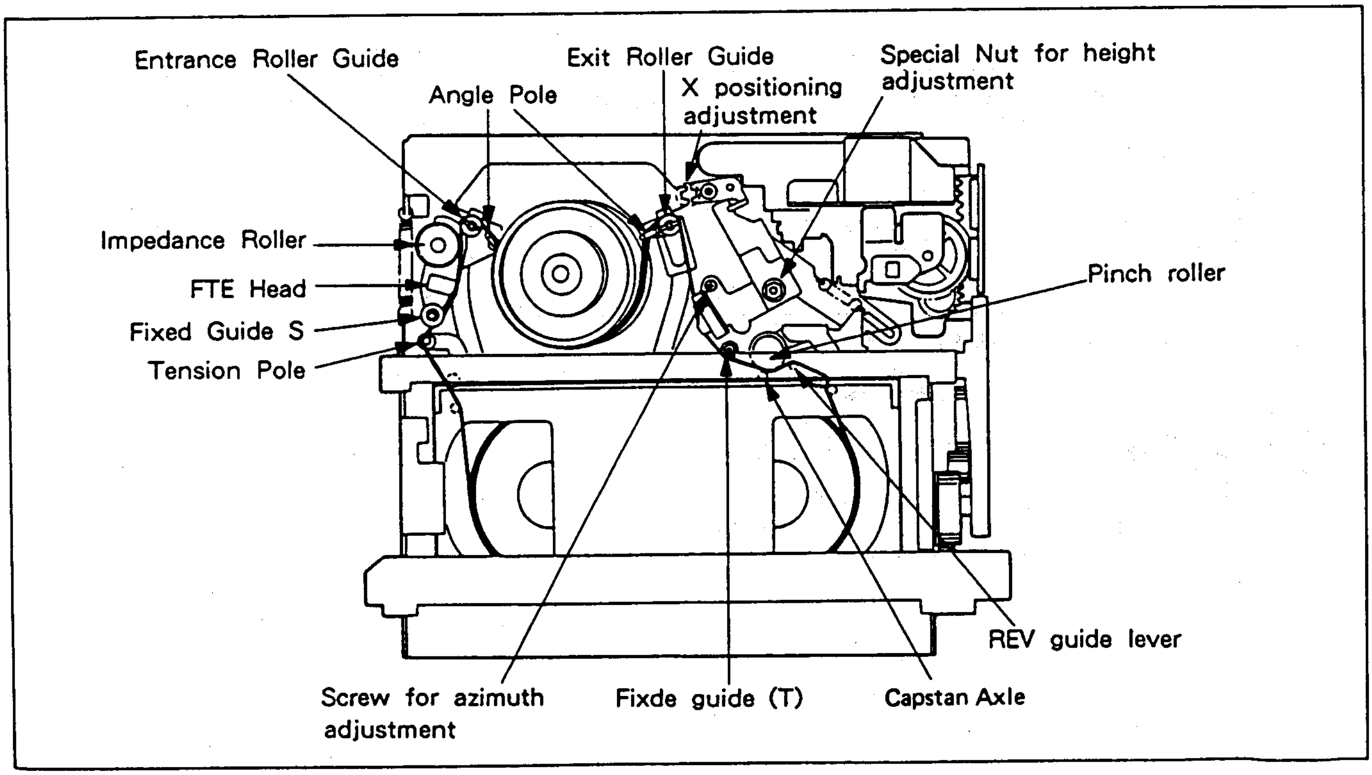
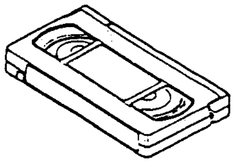

Entrance Roller Guide
Exit Roller Guide
Special Nut for height adjustment
Angle Pole
X positioning adjustment
Impedance Roller
FTE Head
Fixed Guide S
Tension Pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Fixde guide (T)
Capstan Axle

Fig. 4-1-2. Cleaning

4-1-3. Service Jigs

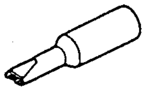
No.	Jig	Jig No.	Remarks
1	Alignment tape	H-7099-052-H	PAL-NORMAL
2	Eccentric screwdriver (VHJ-0003)	J-6082-044-A	For tape path adjustment
3	Nut box (VHJ-0048)	J-6082-045-A	For tape path adjustment
4	Torque gauge	H-7099-039-H	For reel take-up torque measurement
5	Torque gauge adapter	H-7099-035-H	For reel take-up torque measurement
6	Fixed guide height gauge (VHJ-0053)	J-6082-052-A	For fixed guide (S) height adjustment
7	Torque gauge screwdriver (VHJ-0014)	J-6082-047-A	For screw fastening torque adjustment
8	3mm dia. bit for torque screwdriver (VHJ-0045)	J-6082-048-A	Spare bit for the torque gauge screwdriver
9	Video head removing tool (VHJ-0041)	J-6082-049-A	For upper drum removal
10	Mode selector (VHJ-0050)	J-6082-050-A	For mechanism mode selection
11	Master plane	H-7099-279-H	Reel table height
12	Reel disc height jig	H-7099-038-H	Reel table height
13	Mode selector relay (VHJ-0070)	J-6082-077-A	
14	PAL torque cassette (VHT-063S)	J-6082-066-A	For back tension torque

H-7099-052-H



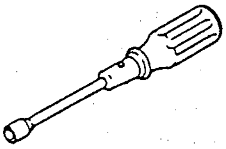
No. 1

J-6082-044-A (VHJ-0003)



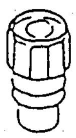
No. 2

J-6082-045-A (VHJ-0048)



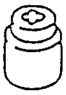
No. 3

H-7099-039-H



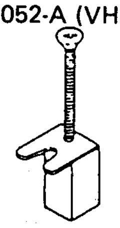
No. 4

H-7099-035-H



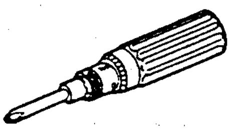
No. 5

J-6082-052-A (VHJ-0053)



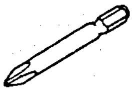
No. 6

J-6082-047-A (VHJ-0014)



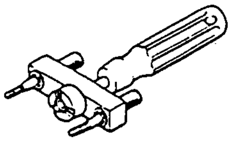
No. 7

J-6082-048-A (VHJ-0045)



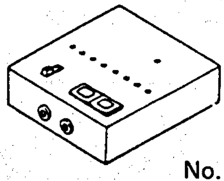
No. 8

J-6082-049-A (VHJ-0041)



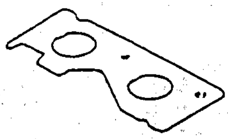
No. 9

J-6082-050-A (VHJ-0050)



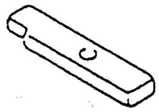
No. 10

H-7099-279-H



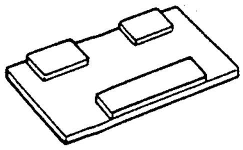
No. 11

H-7099-038-H



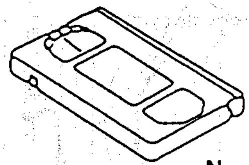
No. 12

J-6082-077-A (VHJ-0070)



No. 13

J-6082-066-A



No. 14

4-2. MODE SELECTOR (VHJ-0050) HANDLING INSTRUCTIONS

The mode selector drives the loading motor of the P88 mechanism with its internal batteries (UM-2 × 4 = 6V), using LEDS to indicate the mode (EJECT, INITIAL, BRAKE, STOP/REW/FWD, STILL, PLAY, IDLER, REV) simultaneously with EJECT⇔REV mode changes.
Instead of the internal batteries, an external DC 6V power supply can also be used.

4-2-1. Part Names (See Fig. 4-2-1)

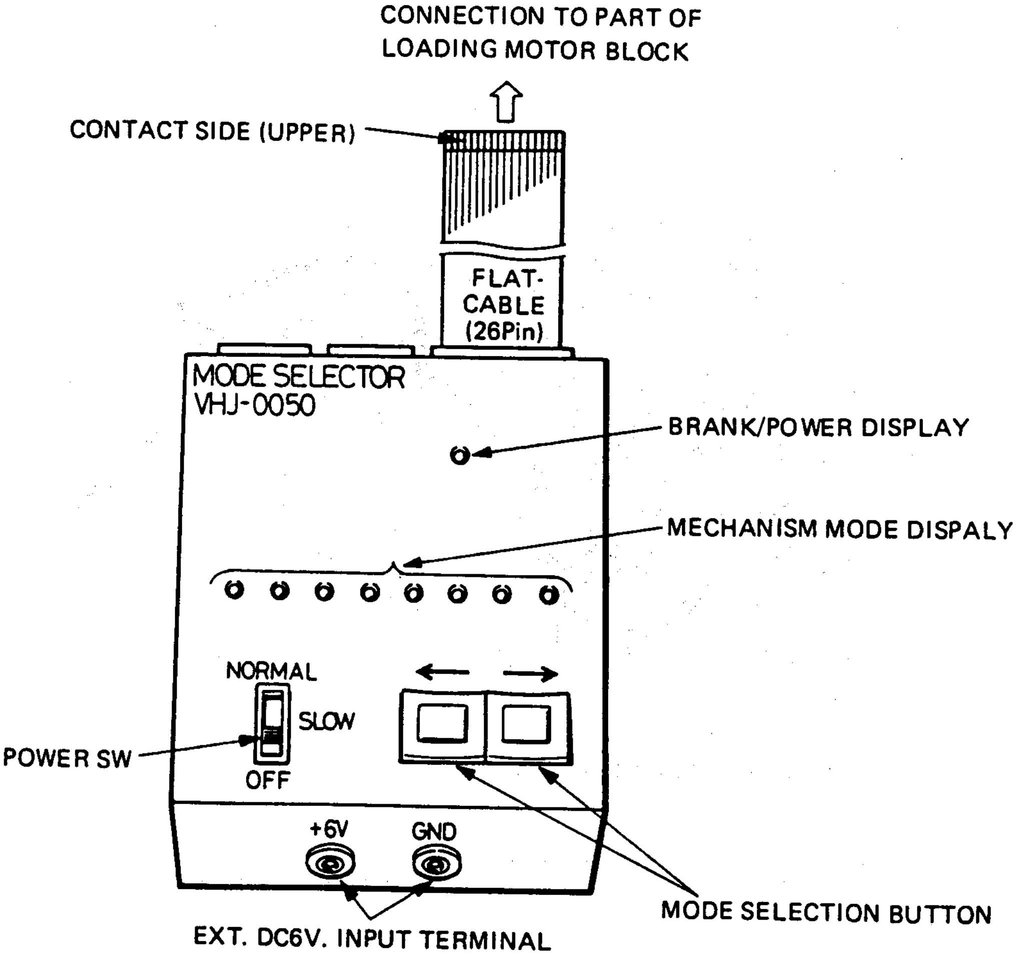

CONNECTION TO PART OF LOADING MOTOR BLOCK
CONTACT SIDE (UPPER)
FLAT-CABLE (26Pin)
MODE SELECTOR VHJ-0050
BRANK/POWER DISPLAY
MECHANISM MODE DISPALY
NORMAL
SLOW
OFF
POWER SW
+6V
GND
EXT. DC6V. INPUT TERMINAL
MODE SELECTION BUTTON

Fig. 4-2-1

4-2-2. Connection (See Fig. 4-2-2)

1) Remove the flexible flat cable connected to the socket (CN812) on the COMPL MC-2 board.
2) Connect the flexible flat cable from the mode selector to the socket (CN812) on the COMPL MC-2 board mentioned in 1).

Note : When connecting, be sure to place the contact surface of the flexible flat cable in the proper direction.

4-2-3. Handling

1) Keep the right side (⇨) of the mode selector key pressed, and the mode will change in the following sequence : EJECT⇨INITIAL⇨BRAKE⇨STOP/REW/FWD⇨STILL⇨PLAY⇨IDLER⇨REV.
2) When changing the mode in the REV···⇨EJECT direction, press the Left side (⇦) of the mode selector key until the desired mode is indicated.
3) At intermediate positions between modes, the "BLANK" LED lights up (When the mode selector is not connected to the mechanism, the "BLANK" LED indicates that power is on).
4) The SLOW position of the POWER switch allows for a slower operation than the NORMAL position.

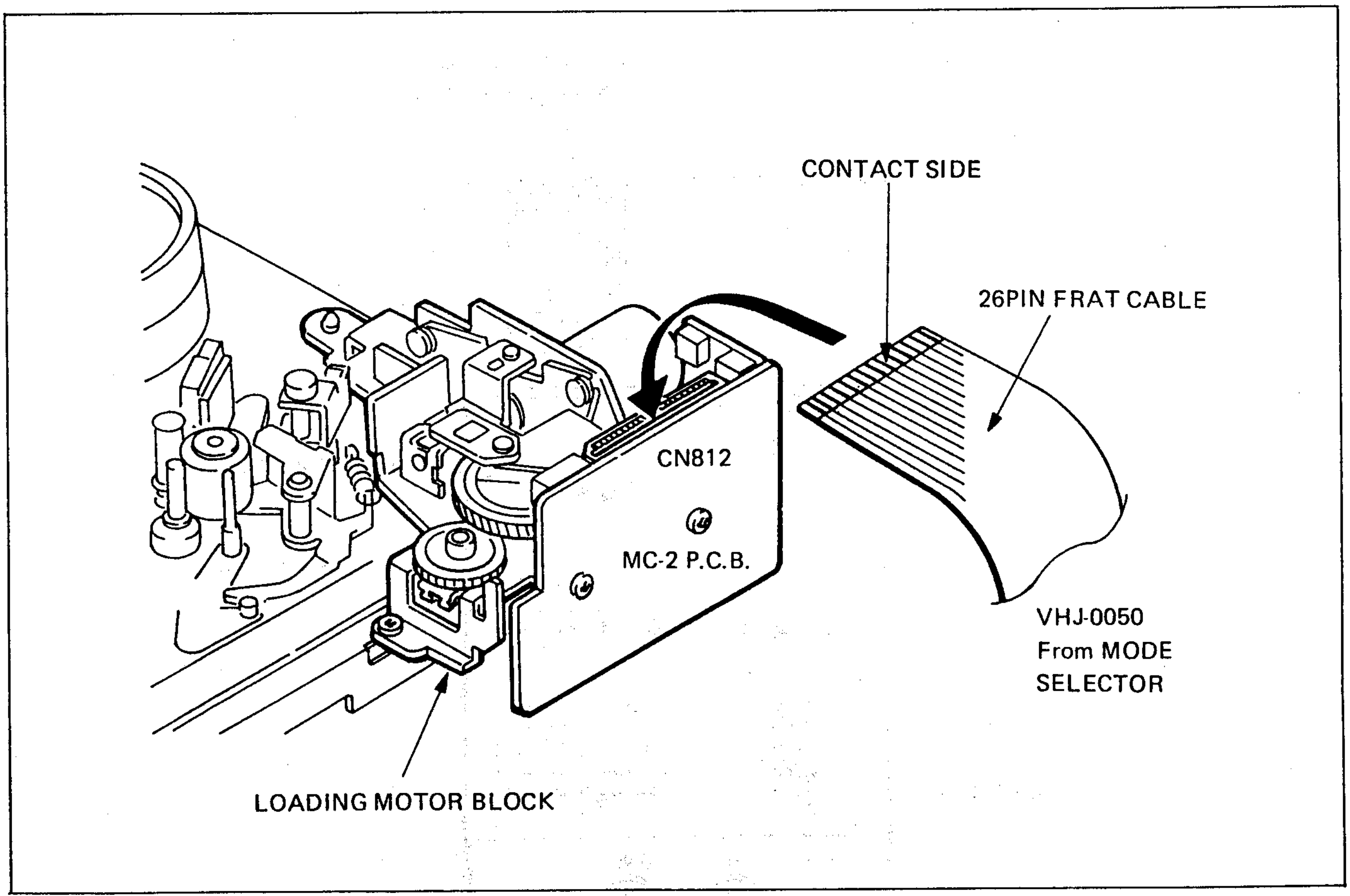


Fig. 4-2-2

Note 1 : The mode selector drives the loading motor only, not affecting the head drum motor and the capstan motor. When using the mode selector with a cassette loaded, turn the capstan motor manually to remove tape slackness, preventing tape entanglement.

Note 2 : If the Left side (⇐) of the mode selector (VHJ-0050) key is kept pressed with the COMPL cassette mechanism removed, it might get past the EJECT position, causing the front helical gear and the front worm gear to get disengaged.

In this condition, since the front helical gear will not turn even if the right side (⇒) of the mode selector key is pressed, rotate (push) the front helical gear clockwise by hand and engage it with the front worm gear. In this condition, as there is a misalignment between the mechanism main body operation mode (indicated by the mode selector indicator lamps) and the front loading mechanism operation mode, keep the right side (⇒) of the mode selector key pressed until the front helical gear and the front loading gear of the front loading mechanism get back to the initial condition (Refer to A and B in Fig. 5-3-5 of section 5-3-2. Loading Motor).
When the front loading mechanism returns to the initial condition, operation mode of the whole mechanism gets back to normal, matching the mode shown by the mode selector indicator lamps (mode is not properly indicated, however, during eject).
Sometimes, engagement of the front helical gear with the front worm gear is delayed, operation mode of the mechanism main body gets too much ahead and the front loading mechanism mode cannot be switched to the initial condition. In that case, press the Left side (⇐) of the mode selector key, setting the mechanism main body operation mode back to EJECT (rotation of the mode cam and the MAIN CAM stops).

Note 3 : The mode selector indicator lamps show the mechanism operation mode, but the EJECT lamp may sometimes fail to indicate the actual mechanism operation mode.

When setting the mechanism to the EJECT or INITIAL mode for dismounting or reassembling, fine adjustment of the each gear and cam, etc., marking positions is required after the mode selector indicator lamp has lighted up. Perform this with the mode selector switch in the SLOW position.

5. MECHANISM DISMANTLING AND REASSEMBLING

5-1. MECHANISM MAIN UNIT (See Fig. 5-1-1.)

1. Removal

1) Remove the connectors of the COMPL MC-2, the COMPL MC-3 and the COMPL HEAD BRACKET.
2) Remove the flexible P.C.B. ① connecting the COMPL CYLINDER to the COMPL VP-1 ③ (See Fig. A).
3) Remove the two screws ②, then remove the COMPL VP-1 ③.
4) Remove the screw ④, then remove the PRE-AMP. BRACKET ⑤.
5) Remove the two screws ⑥.
6) Remove the three screws ⑦ and two screws ⑩, then lift up the mechanism main unit and remove it.
   Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock, then slide the TRAY ⑧ before removing the screws.

Note : Shape of the COMPL VP-1 ③ and the PRE-AMP. BRACKET ⑤ differ depending on the model.

2. Remounting

1) Mount the mechanism main unit onto the chassis with the three screws ⑦ and two screws ⑩.
2) Tighten the two screws ⑥.
3) Mount the PRE-AMP. BRACKET ⑤ with the two screws ④.
4) Mount the COMPL VP-1 ③ and the ground lug with the two screws ② (some models are not provided with a ground lug).
5) Insert the flexible P.C.B. ① into the connector of the COMPL VP-1.
6) Connect the connectors of the COMPL MC-2, COMPL MC-3 and COMPL HEAD BRACKET.

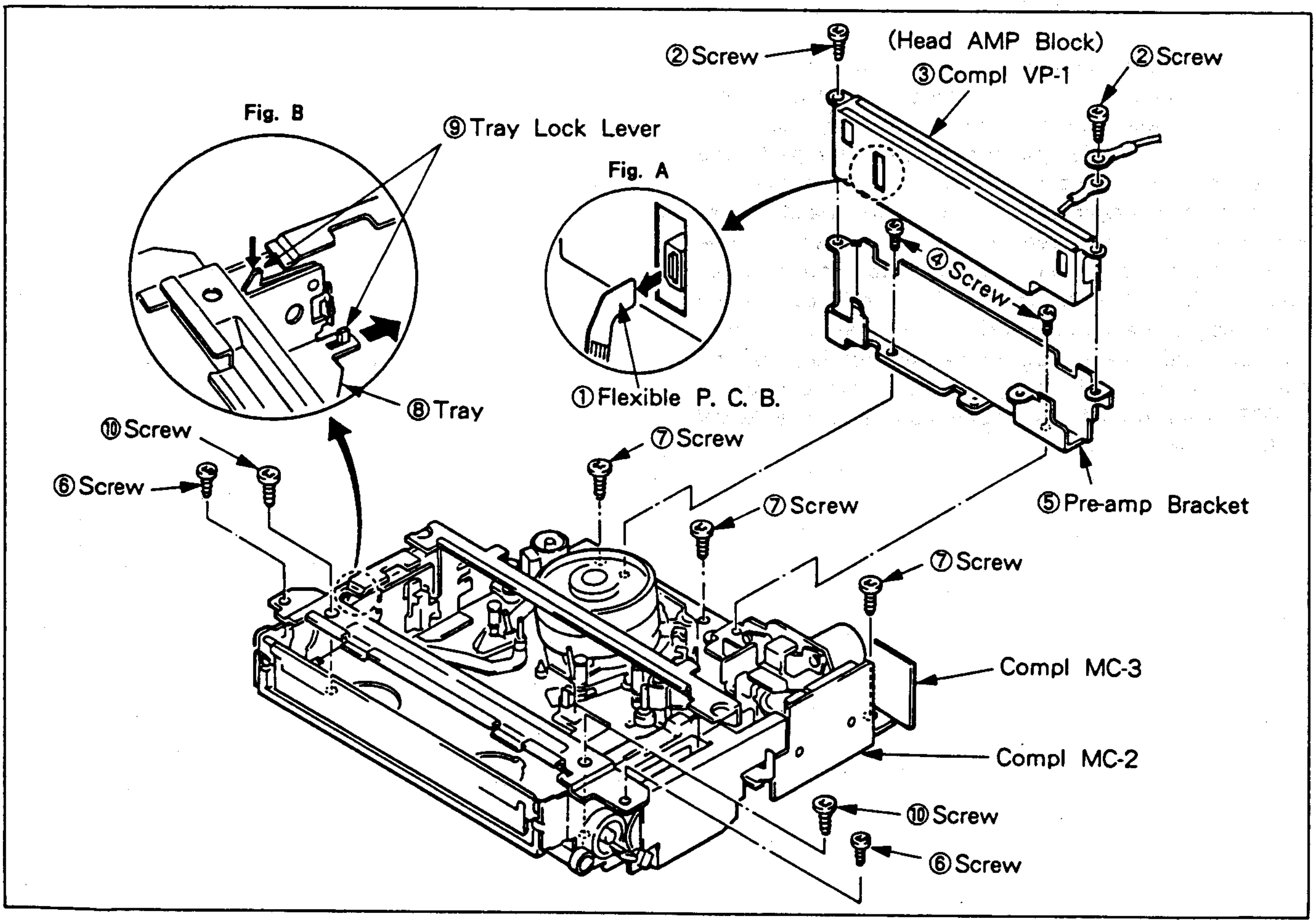

②Screw
(Head AMP Block)
③Compl VP-1
②Screw
Fig. B
⑨Tray Lock Lever
Fig. A
④Screw
①Flexible P. C. B.
⑧Tray
⑩Screw
⑥Screw
⑦Screw
⑦Screw
⑤Pre-amp Bracket
⑦Screw
Compl MC-3
Compl MC-2
⑩Screw
⑥Screw

Fig. 5-1-1 Mecahnism Main Unit

5-2. CASSETTE HOLDER MECHANISM

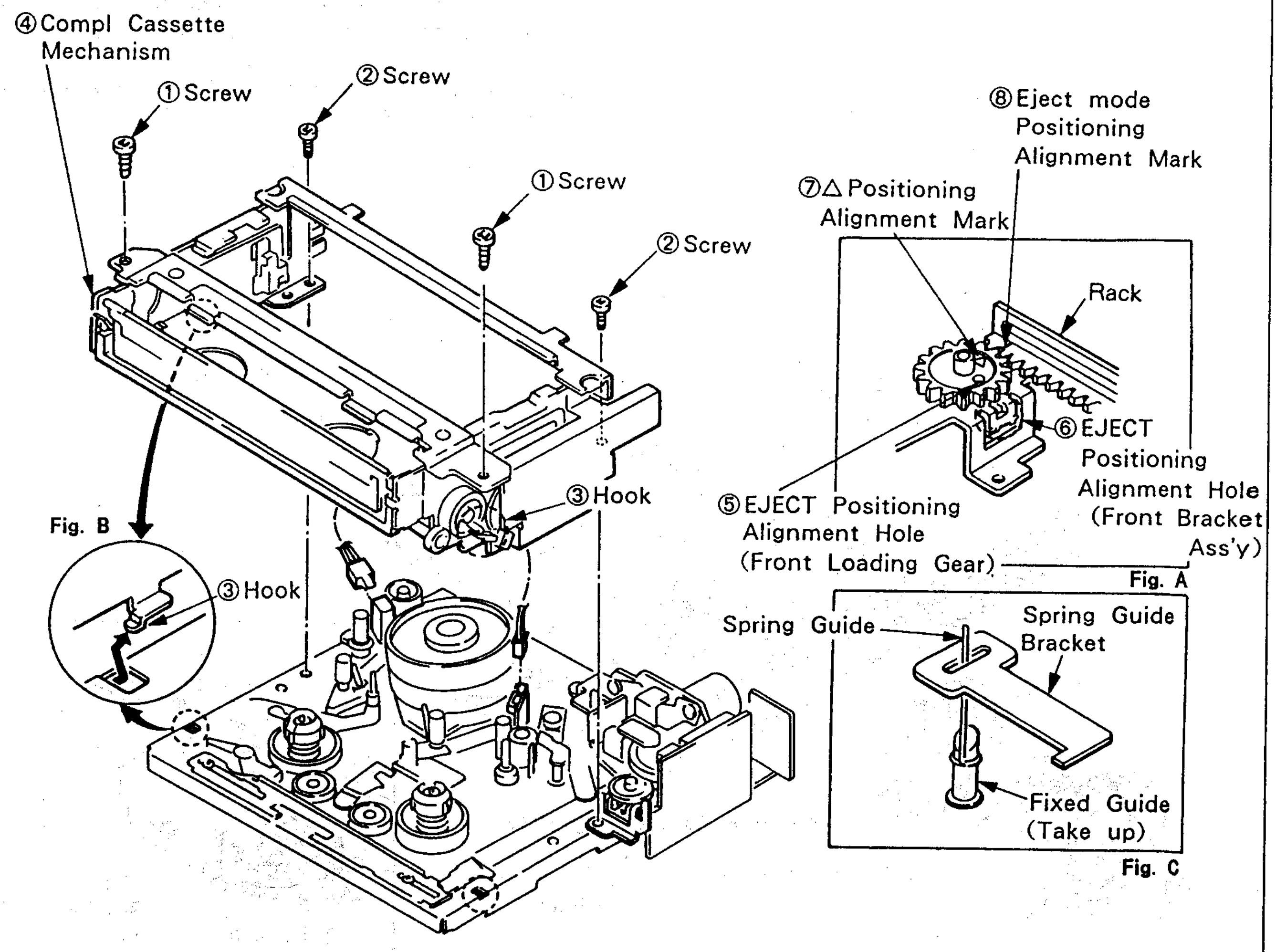
5-2-1. COMPL Cassette Mechanism (See Fig. 5-2-1.)

1. Removal

1) Set the video main unit to the EJECT completed mode.
2) Remove the connectors connected to the COMPL MC-2, the ACE head and the FTE head.
3) Remove the two screws ①.
4) Remove the two screws ②.
5) Lift up the COMPL CASSETTE MECHANISM ④ back a little and remove the two hooks ③ on the front (See Fig. B). When doing so, make sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from above, match the front loading gear hole ⑤ with the FRONT BRACKET ASS'Y hole ⑥ as shown in Fig. A).
2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance.
   Match positions of the FRONT LOADING GEAR △ mark ⑦ and the RACK EJECT mark ⑧.
4) Fix to the mechanism chassis with the two screws ②.
5) Fix to the chassis with the screw ①.
6) Connect to the various connectors.



④Compl Cassette Mechanism
①Screw
②Screw
①Screw
②Screw
③Hook
Fig. B
③Hook
⑧Eject mode Positioning Alignment Mark
⑦△ Positioning Alignment Mark
Rack
⑥EJECT Positioning Alignment Hole (Front Bracket Ass'y)
⑤EJECT Positioning Alignment Hole (Front Loading Gear)
Fig. A
Spring Guide
Spring Guide Bracket
Fixed Guide (Take up)
Fig. C

Fig. 5-2-1 Compl Cassette Mechanism

5-2-2. Gear Bracket Ass'y (See Fig. 5-2-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the four screws ①, then remove the GEAR BRACKET ASS'Y ②.
3) Remove the E ring ③, then remove the LOCK GEAR ④, the PINION LEVER ASS'Y ⑤, the PINION GEAR ⑥ and the RACK ⑦, in that order.

2. Remounting

1) Apply grease to the shaft ⑧ and the two pins ⑨ of the GEAR BRACKET ASS'Y.
2) Apply grease to the pin ⑩ of the PINION LEVER ASS'Y.
3) Apply grease to the toothed part of the RACK ⑦.
4) Fit the RACK ⑦ onto the two pins ⑨. Match position of the hole ⑪ to the GEAR BRACKET hole ⑫.
5) Mount the PINION GEAR ⑥, the PINION LEVER ASS'Y ⑤ and the LOCK GEAR ④ onto the axle ⑧, in that order.
   Do it so that the PINION GEAR and LOCK GEAR HOLE ⑬ is aligned with the GEAR BRACKET hole ⑫.
6) Mount the E ring onto the axle ⑧.
7) Mount the GEAR BRACKET ASS'Y with the four screws ①, aligning it with the protuberance.
   When doing so, make sure that RACK and GEAR do not get misplaced with regard to each other.
   Also confirm that the FL START SWITCH ⑭ is ON.
8) Remount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

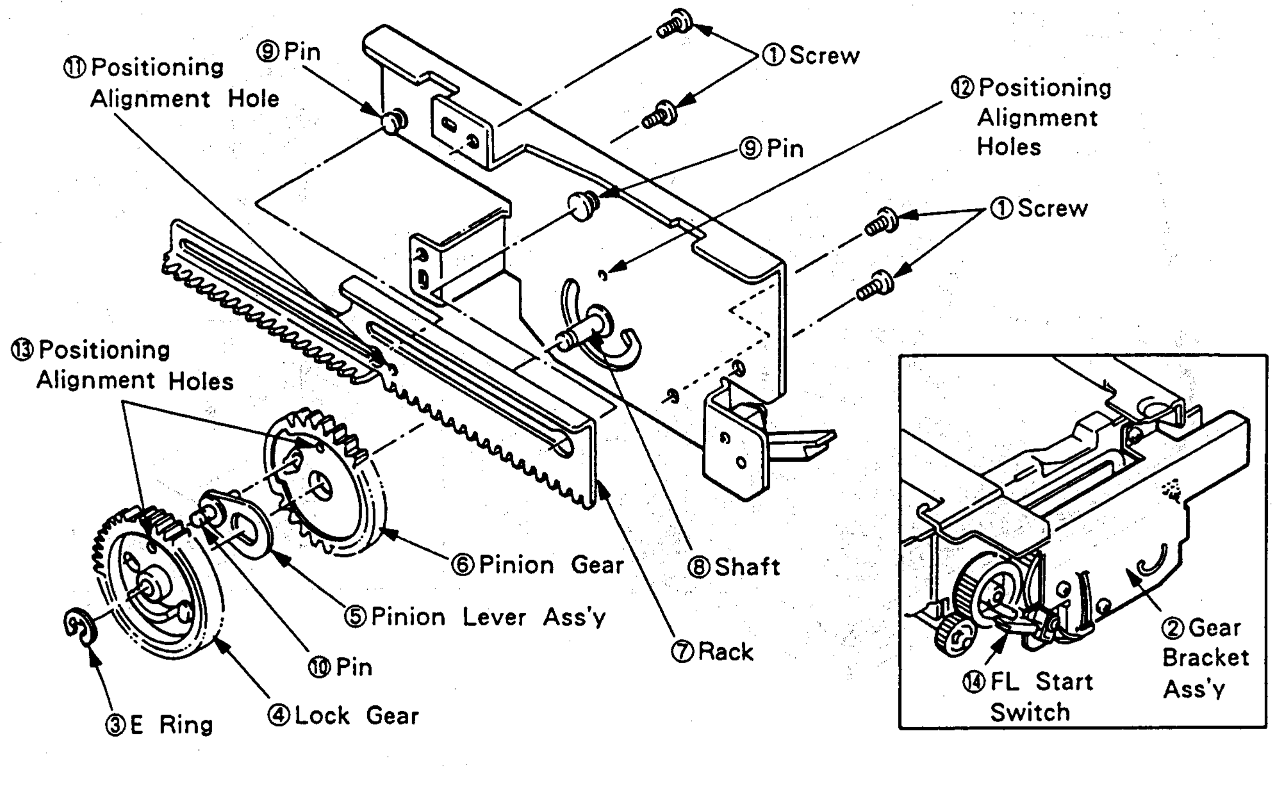

⑪Positioning Alignment Hole
⑨Pin
①Screw
⑫Positioning Alignment Holes
⑨Pin
①Screw
⑬Positioning Alignment Holes
⑥Pinion Gear
⑧Shaft
⑤Pinion Lever Ass'y
⑦Rack
⑩Pin
③E Ring
④Lock Gear
②Gear Bracket Ass'y
⑭FL Start Switch

Fig. 5-2-2. Gear Bracket Ass'y

5-2-3. Cassette Drive Gear (Right) (See Fig. 5-2-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in 5-2-1. and 5-2-2., respectively.
2) Remove the IDLER GEAR ①.
3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
4) Remove the E ring ④, then remove the LEVER GEAR ASS'Y R ⑤.
5) Open the hook ⑥ and remove the COUPLE GEAR R ⑦. Take care not to open the hook ⑥ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the IDLER GEAR R ⑧.

2. Remounting

1) Apply grease to gear parts that undergo friction.
2) Mount the IDLER GEAR R ⑧ onto the axle ⑨.
3) Mount the COUPLE GEAR R ⑦ onto the ROD ASS'Y axle ⑩. When doing so, match the couple gear position with the IDLER GEAR R ⑧ as shown in Fig. A.
4) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Match position to the IDLER GEAR R ⑧ as shown in Fig. A.
5) Mount the E ring ④ onto the axle ⑫.
6) Mount the MAIN GEAR ③ onto the axle ⑪. When doing so, match position to the IDLER GEAR R ⑧ as shown in Fig. A.
7) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR R ③ and the LEVER GEAR ASS'Y R.
8) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, match position to the MAIN GEAR as shown in Fig. A.
9) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM ASS'Y as instructed in 5-2-2. and 5-2-1., respectively.

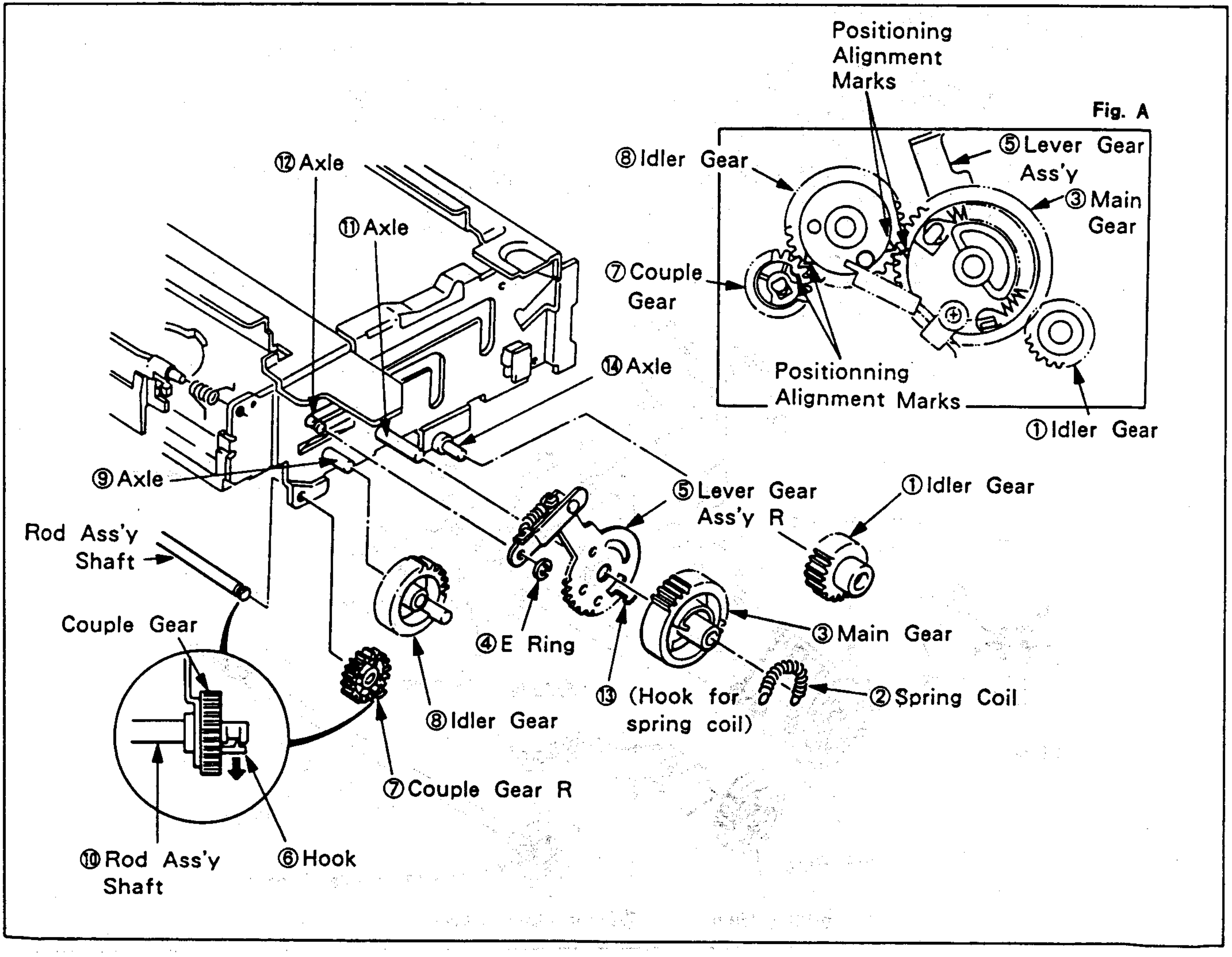

Positioning Alignment Marks
Fig. A
⑤Lever Gear Ass'y
③Main Gear
⑧Idler Gear
⑦Couple Gear
⑭Axle
Positionning Alignment Marks
①Idler Gear
⑫Axle
⑪Axle
⑨Axle
Rod Ass'y Shaft
Couple Gear
⑩Rod Ass'y Shaft
⑥Hook
⑦Couple Gear R
⑧Idler Gear
④E Ring
⑬ (Hook for spring coil)
⑤Lever Gear Ass'y R
①Idler Gear
③Main Gear
②Spring Coil

Fig. 5-2-3. Cassette Drive Gears (Right Side)

5-2-4. Cassette Drive Gear (Left) (See Fig. 5-2-4)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the COUPLE GEAR R as instructed in 5-2-3.
3) Remove the ROD ASS'Y ①.
4) Remove the E ring ②.
5) Remove the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y ④.
7) Remove the IDLER GEAR L ⑥ and the DOOR OPEN LEVER ⑦.

2. Remounting

1) Apply grease to the axles ⑧, ⑨ and ⑩.
2) Apply grease to the IDLER GEAR L ⑥.
3) Mount the DOOR OPEN LEVER ⑦ onto the axle ⑧. Do it so that the end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig. A.
4) Mount the IDLER GEAR L ⑥ onto the axle ⑧.
5) Pass the ROD ASS'Y ① through the hole ⑫. Match position of the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig B.
6) Mount the COUPLE GEAR R as instructed in 5-2-3.
7) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
8) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Match position to the IDLER GEAR L ⑥ as shown in Fig. B.
9) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in 5-2-1.

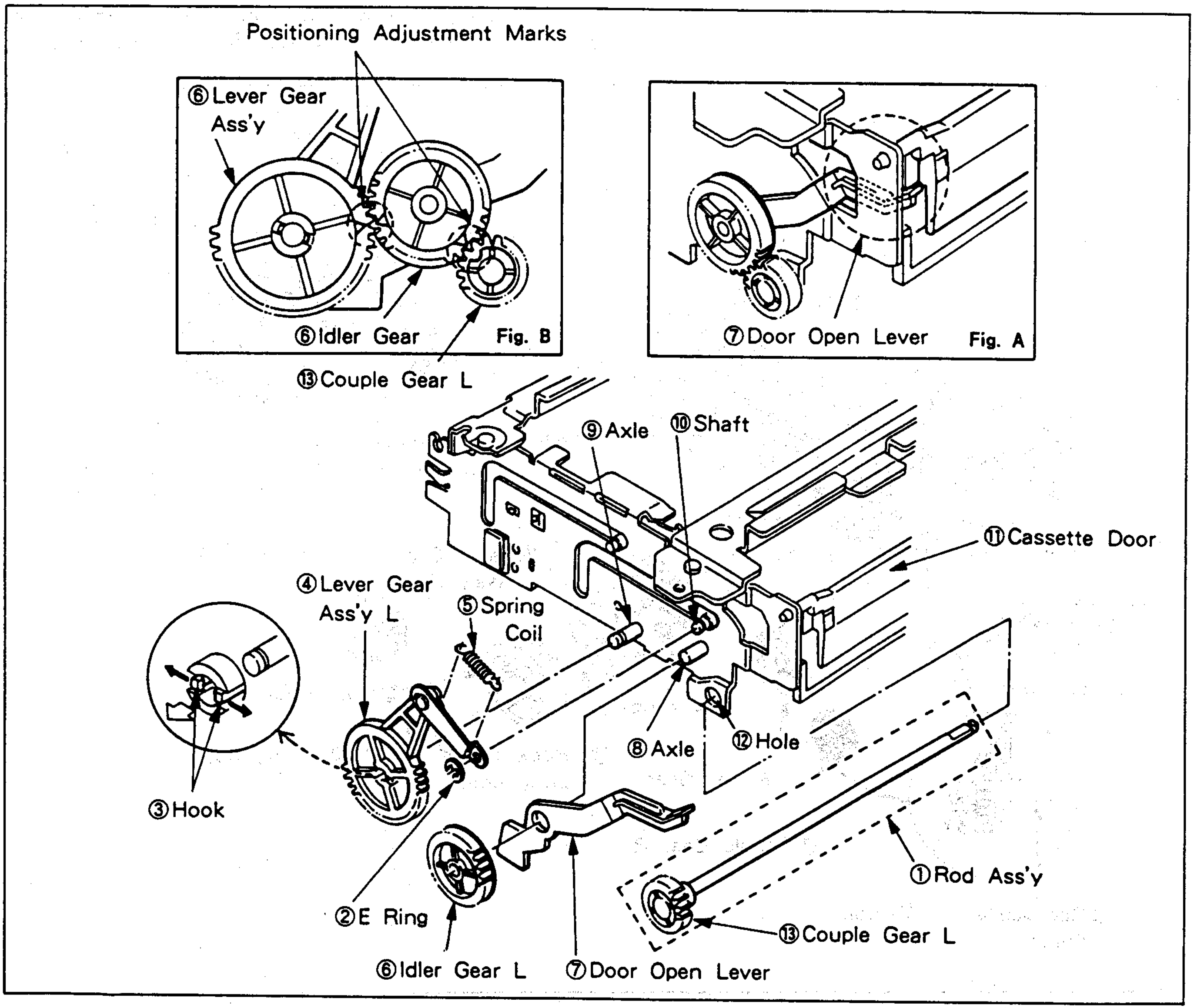

Positioning Adjustment Marks
⑥Lever Gear Ass'y
⑥Idler Gear
Fig. B
⑬Couple Gear L
⑦Door Open Lever
Fig. A
⑨Axle
⑩Shaft
⑪Cassette Door
④Lever Gear Ass'y L
⑤Spring Coil
③Hook
⑧Axle
⑫Hole
①Rod Ass'y
②E Ring
⑬Couple Gear L
⑥Idler Gear L
⑦Door Open Lever

Fig. 5-2-4. Cassette Drive Gears (Left Side)

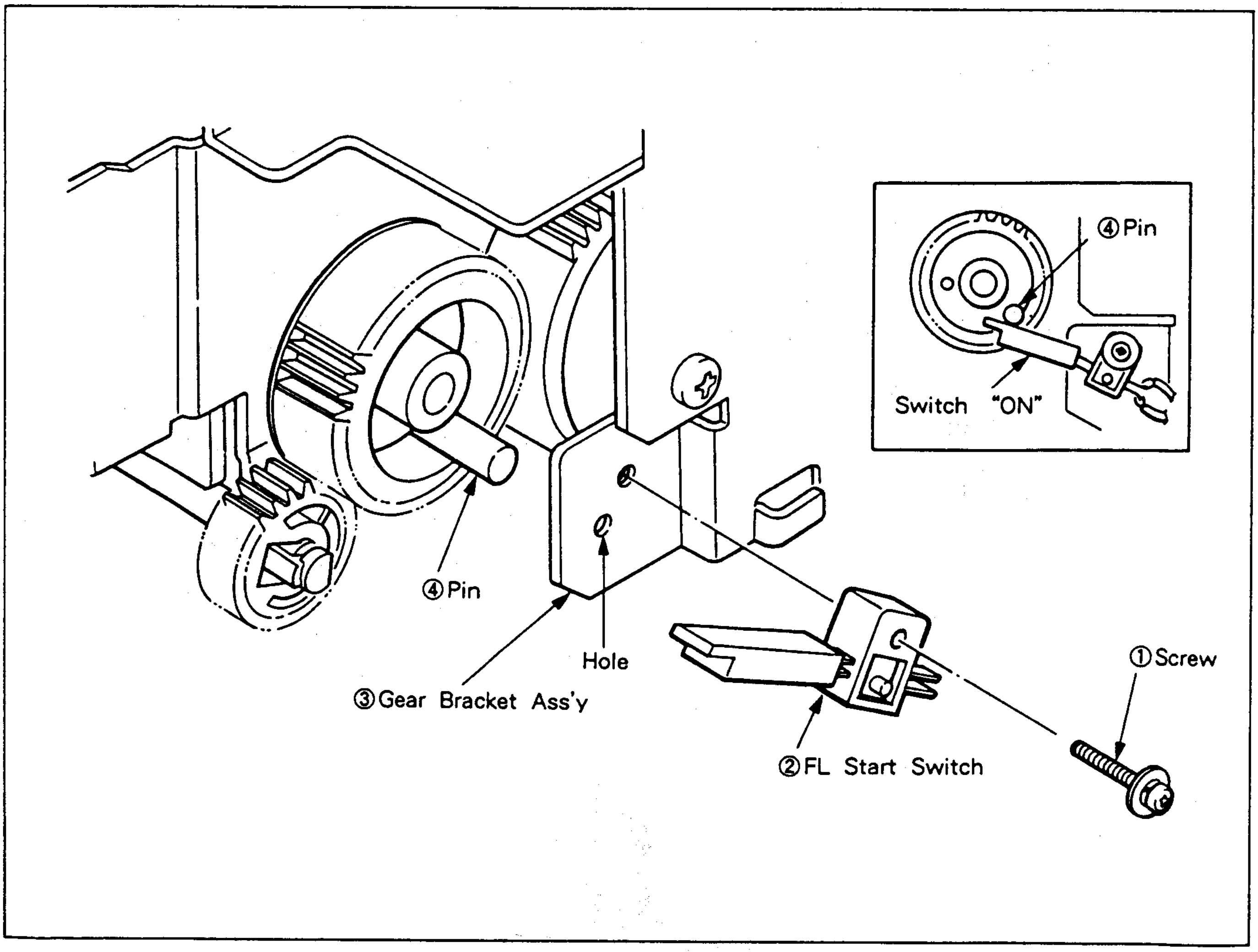
5-2-5. FL Start Switch (See Fig. 5-2-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the screw ①.
3) Remove the lead wire of the FL START SWITCH ②.

2. Remounting

1) Solder the lead wire to the FL START SWITCH ② terminal.
2) Align the FL START SWITCH ② protuberance to the hole, then mount it onto the GEAR BRACKET ASS'Y ③ with the screw ①. Do it so that the FL START SWITCH ② is turned ON by holding the pin ④ of IDLER GEAR in the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.


④Pin
Switch "ON"
④Pin
Hole
③Gear Bracket Ass'y
②FL Start Switch
①Screw

5-2-5. FL Start Switch

5-2-6. T-Top Sensor, T-End Sensor (See Fig. 5-2-6.)

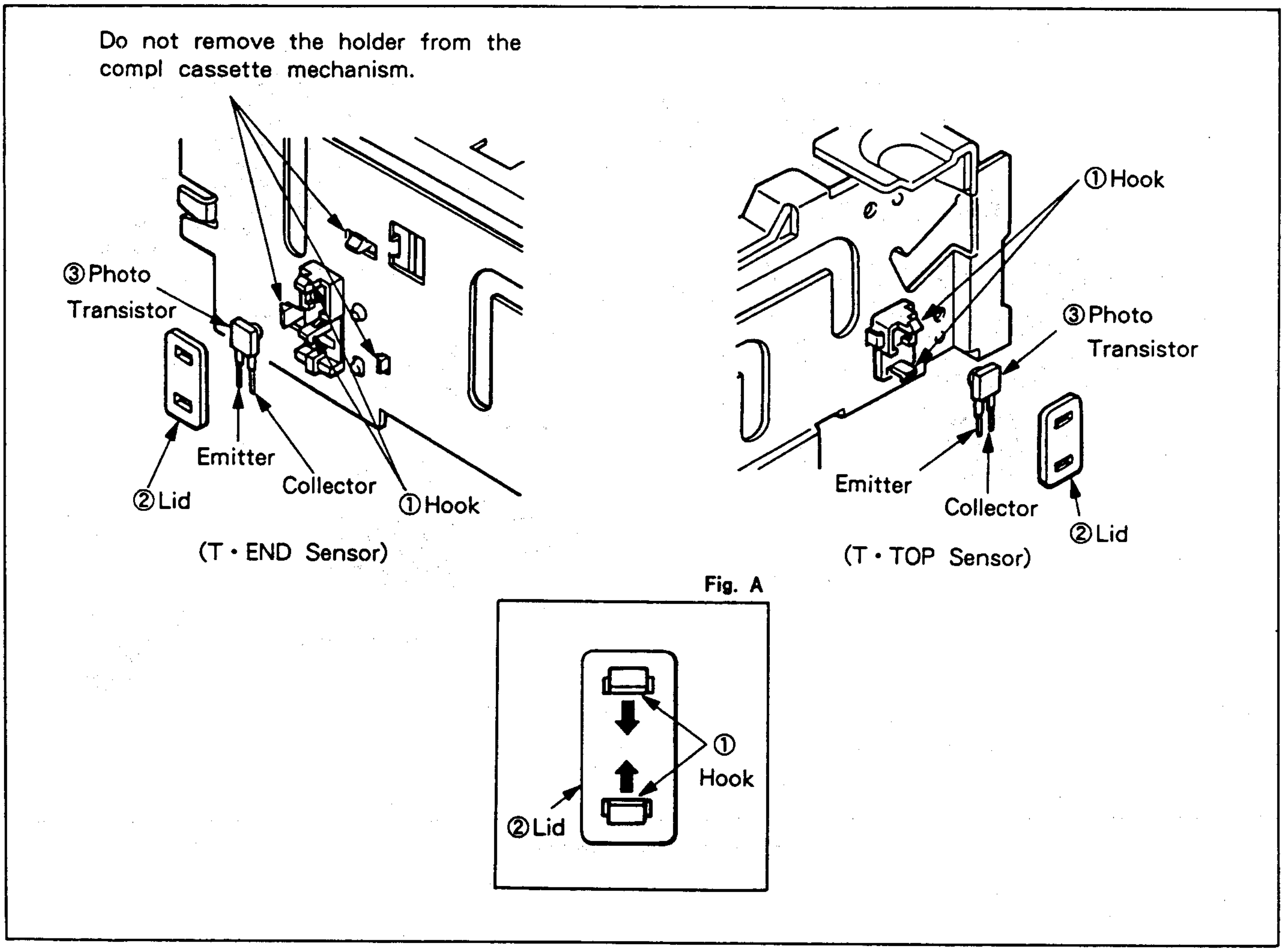
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) When removing the T-TOP SENSOR, remove the GEAR BRACKET ASS'Y as instructed in 5-2-2.
3) Unhook the hook ① as instructed in Fig. A, then remove the LID ②. Take care not to push the hook ① too much, otherwise it may be deformed or broken.
4) Remove the phototransistors ③, then remove the lead wire.

Note : Mounting position of the transistor holder on the T-END SENSOR side is precisely adjusted at the factory, so do never remove it from the COMPL CASSETTE MECHANISM.

2. Remounting

1) Solder the brown lead wire to the emitter side, and the red lead wire to the collector side of the T-TOP SENSOR phototransistor ③.
   Solder the orange lead wire to the emitter side, and the yellow lead wire to the collector side of the T-END SENSOR phototransistor.
2) Mount the phototransistors ③ onto their respective holders.
3) Mount the LID ② and fix it with the hook ①.
4) Mount the GEAR BRACKET ASS'Y as instructed in 5-2-2.
5) Mount the COMPL CASSETTE MECHANISM as insturcted in 5-2-1.


Do not remove the holder from the compl cassette mechanism.

(T • END Sensor)

(T • TOP Sensor)

5-2-6. T TOP Sensor & T END Sensor

5-3. COMPL MOTOR BRACKET (LOADING MOTOR BLOCK)

5-3-1. COMPL Motor Bracket

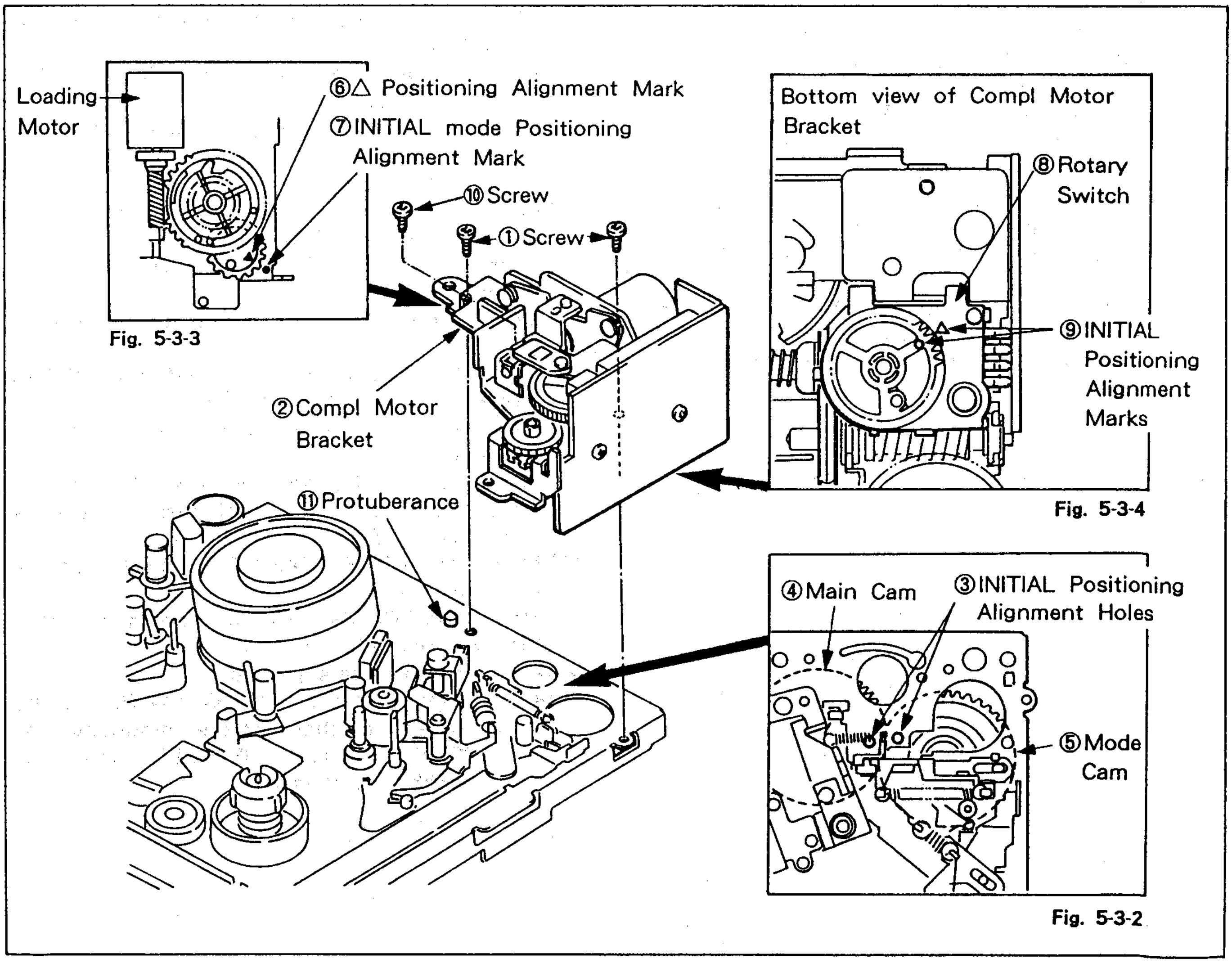
1. Removal

1) Remove the COMPL VP-1 and the PRE-AMP. BRACKET as instructed in 5-1.
2) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
3) Remove the two screws ① and the other one ⑩, then remove the COMPL MOTOR BRACKET ② (see Fig. 5-3-1.).

2. Remounting

1) Set the mechanism chassis to the INITIAL mode. In this mode, look at the mechanism chassis positioning holes ③ just from above and align the MAIN CAM ④ and MODE CAM ⑤ positioning holes as shown in Fig. 5-3-2.
2) Set the COMPL MOTOR BRACKET to the INITIAL mode with the mode selector (VHJ-0050). In this position, the FRONT LOADING GEAR △ mark ⑥ is aligned with the FRONT BRACKET ASS'Y initial position mark ⑦ (see Fig. 5-3-3.).
3) Align the ROTARY SWITCH (mode detector switch) ⑧ with the INITIAL mode position mark ⑨ (see Fig. 5-3-4.).
4) Align the COMPL MOTOR BRACKET main unit ② with the protuberance ⑪, then mount it with the two screws ① and the other one ⑩.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
6) Mount the COMPL VP-1 and the PRE-AMP. BRACKET as instructed in 5-1.

Note : Normal mechanism operation cannot be achieved if initial positioning of the MAIN CAM ④, the MODE CAM ⑤ and the ROTARY SWITCH (mode detector switch) ⑧ are not performed precisely.


Loading Motor
⑥△ Positioning Alignment Mark
⑦INITIAL mode Positioning Alignment Mark
Fig. 5-3-3
⑩Screw
①Screw
②Compl Motor Bracket
⑪Protuberance
Bottom view of Compl Motor Bracket
⑧Rotary Switch
⑨INITIAL Positioning Alignment Marks
Fig. 5-3-4
④Main Cam
③INITIAL Positioning Alignment Holes
⑤Mode Cam
Fig. 5-3-2

5-3-1. Compl Motor Bracket

5-3-2. Loading Motor (See Fig. 5-3-5.)

1. Removal

1) Remove the COMPL VP-1 and the PRE-AMP. BRACKET as instructed in 5-1.
2) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
3) Remove the COMPL MOTOR BRACKET as instructed in 5-3-1.
4) Remove the two screws ①, then remove the COMPL MC-2 ②.
5) Remove the COMPL MC-3 ③ DEW SENSOR connector.
6) Remove the special washer ④.
7) Remove the two screws ⑤ then remove the HOLDER BRACKET ⑥.
8) Remove the FRONT WORM ASS'Y ⑦, the washer ⑧ and the DAMPER ⑨.
9) Remove the washer ⑩ and the FRONT HELICAL GEAR ⑪.
10) Remove the lead wires from the LOADING MOTOR ⑫ terminals.
11) Remove the LOADING BELT ⑬.
12) Remove the two screws ⑭, then remove the STAND BRACKET ⑮.
13) Remove the three screws ⑯, then remove the MOTOR PLATE ⑱ with the MOTOR DAMPER ⑰ attached.
14) Remove the two screws ⑲, then remove the LOADING MOTOR ⑫.

Note 1 : When the WORM HOLDER has been removed, always replace it with a new one to prevent noise generation.

Note 2 : In some models, the COMPL MOTOR BRACKET is not provided with STAND BRACKET ⑮, MOTOR DAMPER ⑰ and MOTOR PLATE ⑱. Also, in some cases the LOADING MOTOR ⑫ is soldered directly to the COMPL MC-2.

2. Remounting

1) Mount the LOADING MOTOR ⑫ to the MOTOR PLATE ⑱ with the two screws ⑲.
2) After mounting the three MOTOR DAMPERS ⑰ onto the MOTOR PLATE ⑱, mount the latter onto the STAND BRACKET ⑮ with the three screws ⑯.
3) Mount the STAND BRACKET ⑮ onto the MOTOR BRACKET ASS'Y ⑳ with the two screws ⑭.
4) Fit the LOADING BELT ⑬ around the pulley.
5) Align the FRONT LOADING GEAR △ mark ㉑ with the FRONT BRACKET ASS'Y initial position mark ㉒ as shown in Fig. A.
6) Apply a thin layer of grease to the axle ㉓ and the whole side surface of the FRONT HELICAL GEAR ⑪.
7) Mount the FRONT HELICAL GEAR ⑪ and the washer ⑩ onto the axle ㉓. Do this so that the FRONT LEVER ASS'Y pin ㉔ gets into the FRONT HELICAL GEAR ⑪ side indent as shown in Fig. B.
8) Mount the DAMPER ⑨ and the FRONT WORM ASS'Y ⑦, in that order, onto the LOADING MOTOR ⑫.
9) Pass the washer ⑧ through the FRONT WORM ASS'Y AXLE ㉕.
10) Mount the HOLDER BRACKET ⑥ with the two screws ⑤, aligning it to the protuberance. the protuberance.
11) Mount the special washer ④ to the FRONT WORM ASS'Y AXLE ㉕.
12) Connect the COMPL MC-3 ③ DEW SENSOR connector.
13) Mount the COMPL MC-2 ② with the two screws ①.
14) Solder the lead wires to the LOADING MOTOR terminals (solder the red lead wire to the (+) terminal and the white lead wire to the (−) terminal).
15) Mount the COMPL MOTOR BRACKET (loading motor block) onto the mechanism chassis as instructed in 5-3-1.
16) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
17) Mount the PRE-AMP. BRACKET and the COMPL VP-1 as instructed in 5-1.

Note 1 : Position gears precisely.

Note 2 : Always set the ROTARY SWITCH to the INITIAL position before mounting the COMPL MOTOR BRACKET onto the mechanism chassis.

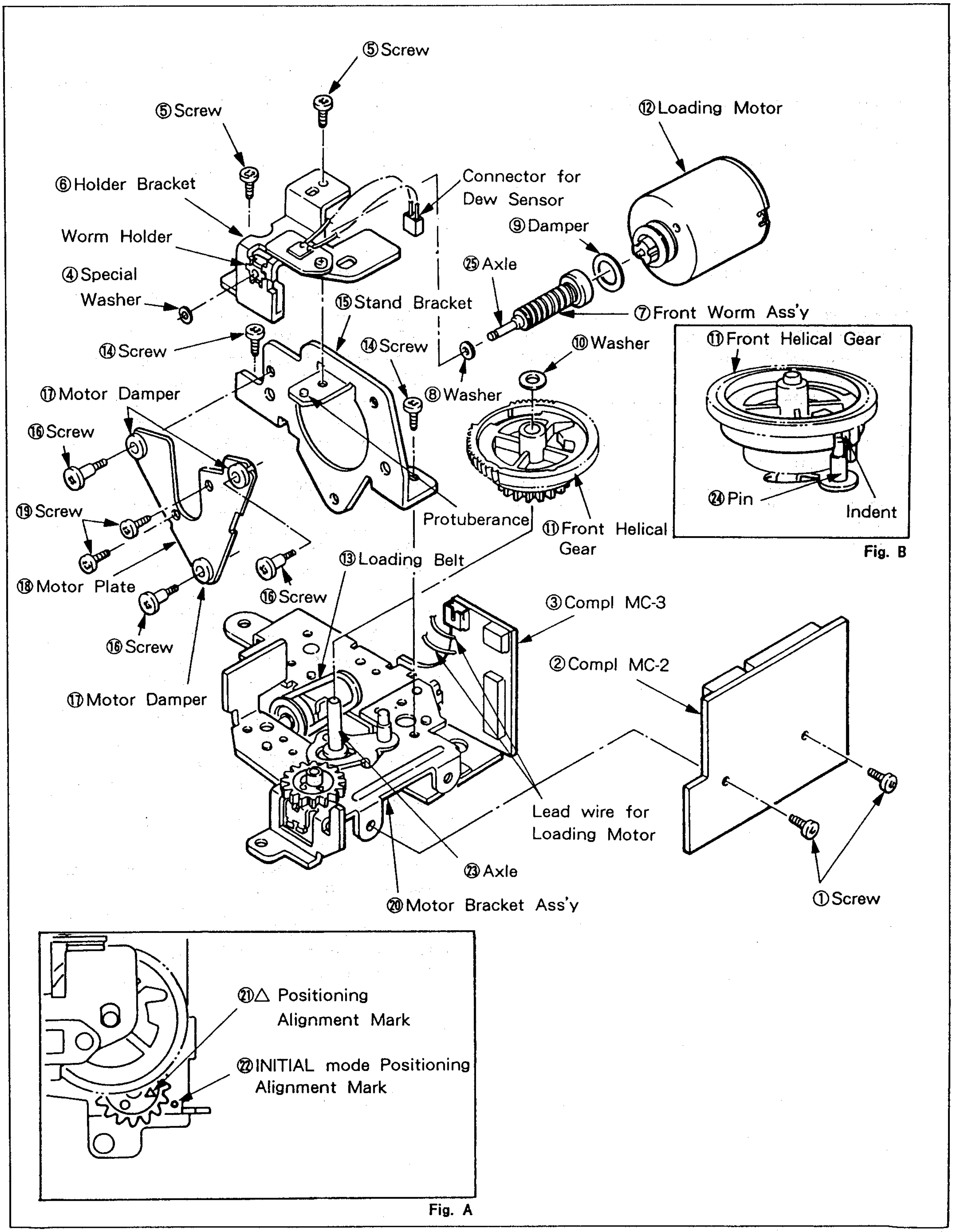

⑤Screw
⑤Screw
⑫Loading Motor
⑥Holder Bracket
Connector for Dew Sensor
⑨Damper
Worm Holder
㉕Axle
④Special Washer
⑮Stand Bracket
⑦Front Worm Ass'y
⑭Screw
⑭Screw
⑩Washer
⑪Front Helical Gear
⑰Motor Damper
⑧Washer
⑯Screw
⑲Screw
Protuberance
⑪Front Helical Gear
㉔Pin
Indent
Fig. B
⑬Loading Belt
⑱Motor Plate
⑯Screw
③Compl MC-3
⑯Screw
②Compl MC-2
⑰Motor Damper
Lead wire for Loading Motor
㉓Axle
⑳Motor Bracket Ass'y
①Screw
㉑△ Positioning Alignment Mark
㉒INITIAL mode Positioning Alignment Mark
Fig. A

Fig. 5-3-5. Loading Motor

5-4. TAPE LOADING MECHANISM

5-4-1. Main Parts of the Tape Loading Mechanism (See Fig. 5-4-1.)

1. Removal

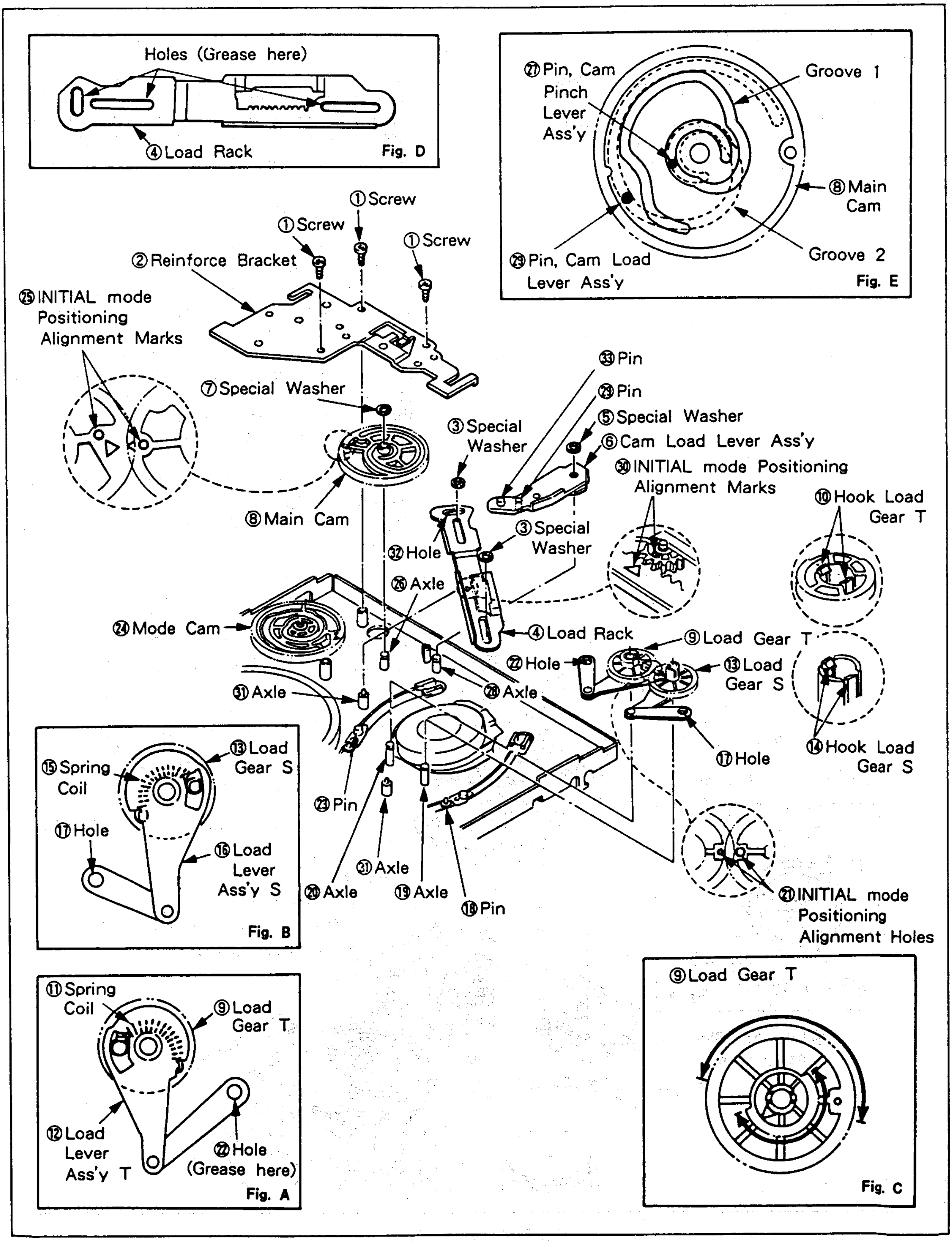
1) Remove connectors from the DRUM MOTOR board (SV-5).
2) Remove the three screws ①, then remove the REINFORCE BRACKET ②.
3) Remove the two special washers ③, then remove the LOAD RACK ④.
4) Remove the special washer ⑤, then remove the CAM LOAD LEVER ASS'Y ⑥.
5) Remove the stop washer ⑦, then remove the MAIN CAM ⑧.
6) Unhook the LOAD GEAR T hook ⑩, then remove the LOAD GEAR T ⑨ as shown in Fig. A, with the SPRING COIL ⑪ and the LOAD LEVER ASS'Y T ⑫ attached to it.
7) Unhook the LOAD GEAR S hook ⑭, then remove the LOAD GEAR S ⑬ as shown in Fig. B, with the SPRING COIL S ⑮ and the LOAD LEVER ASS'Y S ⑯ attached to it.

Note : Take care not to open the LOAD GEAR hooks too much, otherwise they may be deformed or broken. If they are, replace them.

2. Remounting

1) Apply grease to the inner surface of the LOAD LEVER ASS'Y S ⑯ hole ⑰, as shown in Fig. B.
2) Apply grease to the inner surface of the LOAD LEVER ASS'Y T ⑫ hole ㉒ and to the section of the LOAD GEAR T ⑨ indicated with an arrow in Fig. C.
3) Apply grease to GROOVEs 1 and 2 of the MAIN CAM ⑧, and to the outer side of the teeth.
4) Apply grease to the three oval holes of the LOAD RACK ④ as shown in Fig. D.
5) Apply grease to the outer surface of axles ⑲⑳㉖ and ㉘.
6) After assembling as shown in Fig. B, mount the LOAD GEAR S ⑬ onto the axle ⑲. Insert the ROLLER BASE S pin ⑱ into the LOAD LEVER ASS'Y S hole ⑰.
7) After assembling as shown in Fig. A, mount the LOAD GEAR T ⑨ onto the axle ⑳. When doing so, set the LOAD GEAR S ⑬ and the LOAD GEAR T ⑨ to the INITIAL mode position ㉑. Insert the ROLLER BASE T pin ㉓ into the hole ㉒ of the LOAD LEVER ASS'Y T ⑫.
8) Set the MAIN CAM ⑧ to the INITIAL mode position ㉕ with the MODE CAM ㉔, and mount onto the axle ㉖. Confirm that the CAM PINCH LEVER ASS'Y pin ㉗ gets into the MAIN CAM GROOVE 1 as shown in Fig. E.
9) Mount the special washer ⑦ to the axle ㉖.
10) Mount the CAM LOAD LEVER ASS'Y ⑥ onto the axle ㉘. Insert the pin ㉙ into the MAIN CAM GROOVE 2 as shown in Fig. E.
11) Mount the special washer ⑤ onto the axle ㉘.
12) Set the LOAD RACK ④ to the INITIAL mode position ㉚ with the LOAD GEAR T ⑨, and mount onto the two axles ㉛. Insert the CAM LOAD LEVER ASS'Y pin ㉝ into the hole ㉜.
13) Mount the two special washers ③ onto the two axles ㉛.
14) Mount the REINFORCE BRACKET ② with the three screws ①.
15) Insert the connector into the DRUM MOTOR board (SV-5).
16) Confirm that loading and unloading are performed smoothly.

Note : Be sure to perform INITIAL mode positioning of cams and gears precisely.


Holes (Grease here)
④Load Rack
Fig. D
㉗Pin, Cam Pinch Lever Ass'y
Groove 1
⑧Main Cam
Groove 2
㉙Pin, Cam Load Lever Ass'y
Fig. E
①Screw
①Screw
①Screw
②Reinforce Bracket
㉕INITIAL mode Positioning Alignment Marks
⑦Special Washer
⑧Main Cam
㉝Pin
㉙Pin
⑤Special Washer
⑥Cam Load Lever Ass'y
③Special Washer
㉚INITIAL mode Positioning Alignment Marks
⑩Hook Load Gear T
③Special Washer
㉜Hole
㉖Axle
㉔Mode Cam
④Load Rack
⑨Load Gear T
㉒Hole
⑬Load Gear S
㉛Axle
㉘Axle
⑰Hole
⑭Hook Load Gear S
⑮Spring Coil
⑬Load Gear S
⑰Hole
⑯Load Lever Ass'y S
Fig. B
㉓Pin
㉛Axle
⑳Axle
⑲Axle
⑱Pin
㉑INITIAL mode Positioning Alignment Holes
⑪Spring Coil
⑨Load Gear T
⑫Load Lever Ass'y T
㉒Hole (Grease here)
Fig. A
⑨Load Gear T
Fig. C

5-4-1. Loading Mechanism Main Parts

5-4-2. Mode Cam (See Fig. 5-4-2.)

1. Removal

1) Set the INITIAL mode with the mode selector (VHJ-0050).
2) Remove the REINFORCE BRACKET as instructed in 5-4-1.
3) Remove the two stop washers ①, then remove the CAM PLATE SLIDE ASS'Y ②.
4) Remove the MODE CAM ③.

2. Remounting

1) Referring to 5-4-1., confirm that the MAIN CAM is in the INITIAL mode position.
2) In case the MAIN CAM is misplaced, use the mode selector (VHJ-0050) to align the MAIN CAM positioning hole with the chassis INITIAL mode position hole (refer to 5-4-1. for the INITIAL mode position). Since the ROTARY SWITCH (mode detector switch) does not rotate, the mode selector indicator lamp will not show the correct mode.
3) Align the ROTARY SWITCH (mode detector switch) ④ with the INITIAL mode position mark ⑤ as shown in Fig. A.
4) Mount the MODE CAM ③ onto the axle ⑥. Do it so that the SLIDE CAM ASS'Y pin ⑪ is placed in the GROOVE 3 as shown in Fig. B.
5) Mount the CAM PLATE SLIDE ASS'Y ② onto the axles ⑥ and ⑦. Do it so that the pin ⑧ gets into the GROOVE 4 of the MODE CAM as shown in Fig. B, and the point ⑨ of the bent-up part into the ACT PLATE SLIDE ASS'Y hole ⑩.
6) Mount the two special washers ① onto the axles ⑥ and ⑦.
7) Mount the REINFORCE BRACKET as instructed in 5-4-1.

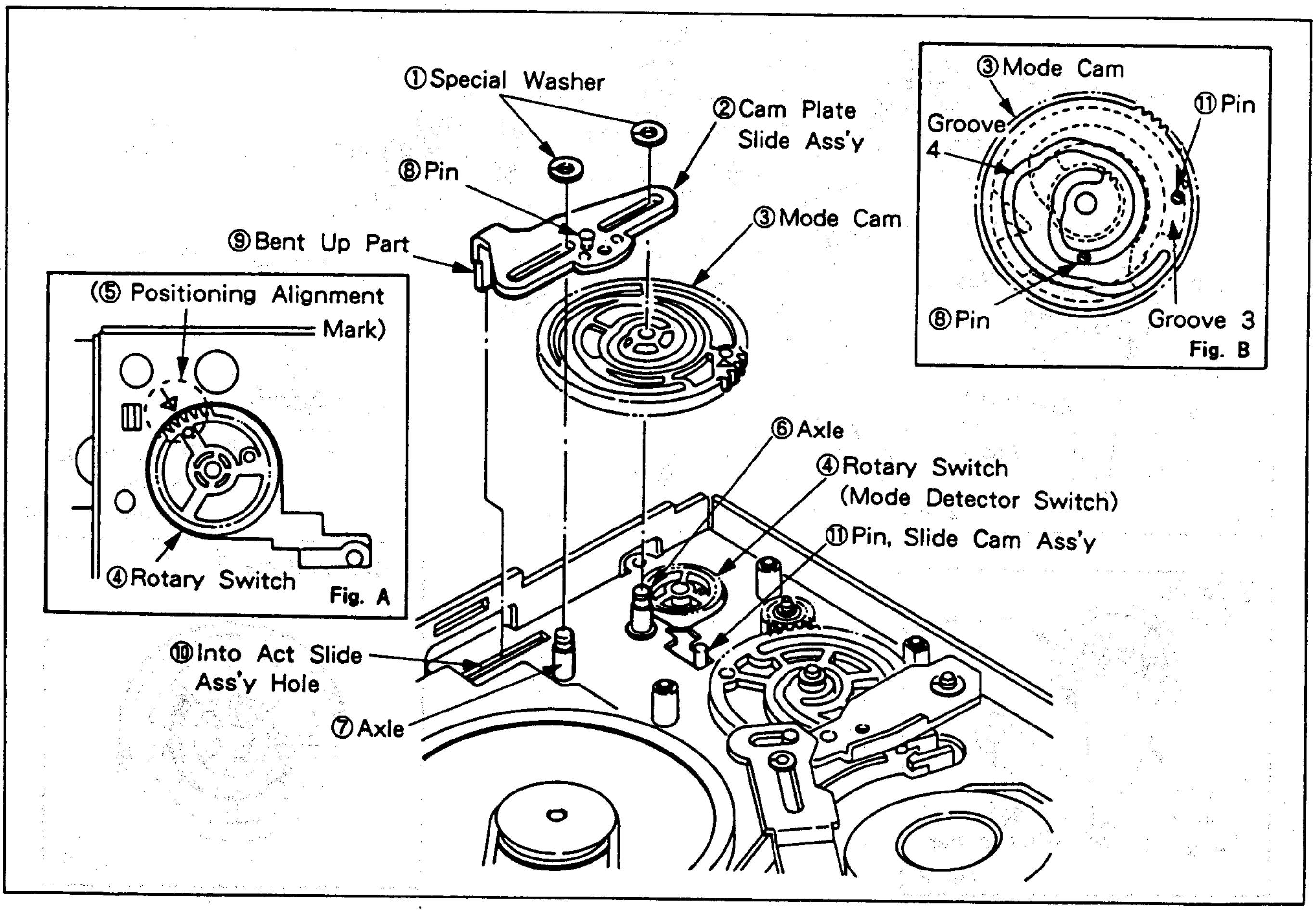

①Special Washer
②Cam Plate Slide Ass'y
⑧Pin
③Mode Cam
⑨Bent Up Part
(⑤ Positioning Alignment Mark)
④Rotary Switch
Fig. A
③Mode Cam
Groove 4
⑪Pin
⑧Pin
Groove 3
Fig. B
⑥Axle
④Rotary Switch (Mode Detector Switch)
⑪Pin, Slide Cam Ass'y
⑩Into Act Slide Ass'y Hole
⑦Axle

Fig. 5-4-2. Mode Cam

5-5. COMPL HEAD BRACKET (ACE HEAD) (See Fig. 5-5-1.)

1. Removal

1) Remove the COMPL HEAD BRACKET special mounting nut ②.
2) Remove the SPACER ③, the COMPL HEAD BRACKET ① and the ACE HEAD SPRING COIL ④, in that order.

Note : Take care not to scratch or soil the ACE head surface.

2. Remounting

1) Apply grease to the axle ⑥ as shown in Fig. A.
2) Apply grease to the spot where the COMPL HEAD BRACKET ① makes contact with the STOPPER ⑦ (See Fig. A).
3) Mount the ACE HEAD SPRING COIL ④ and the COMPL HEAD BRACKET ①, in that order, onto the axle ⑥. Hook one end of the ACE HEAD SPRING COIL ④ to the notch ⑤, and the other end to the COMPL HEAD BRACKET, so that the COMPL HEAD BRACKET is pressed against the STOPPER ⑦ (See Fig. A).
4) Mount the SPECIAL NUT ② onto the axle ⑥ through the SPACER ③.
5) Clean the ACE head surface with a chamois leather moistened with methyl alcohol.
6) Perform ACE head adjustment as instructed in 6-4.

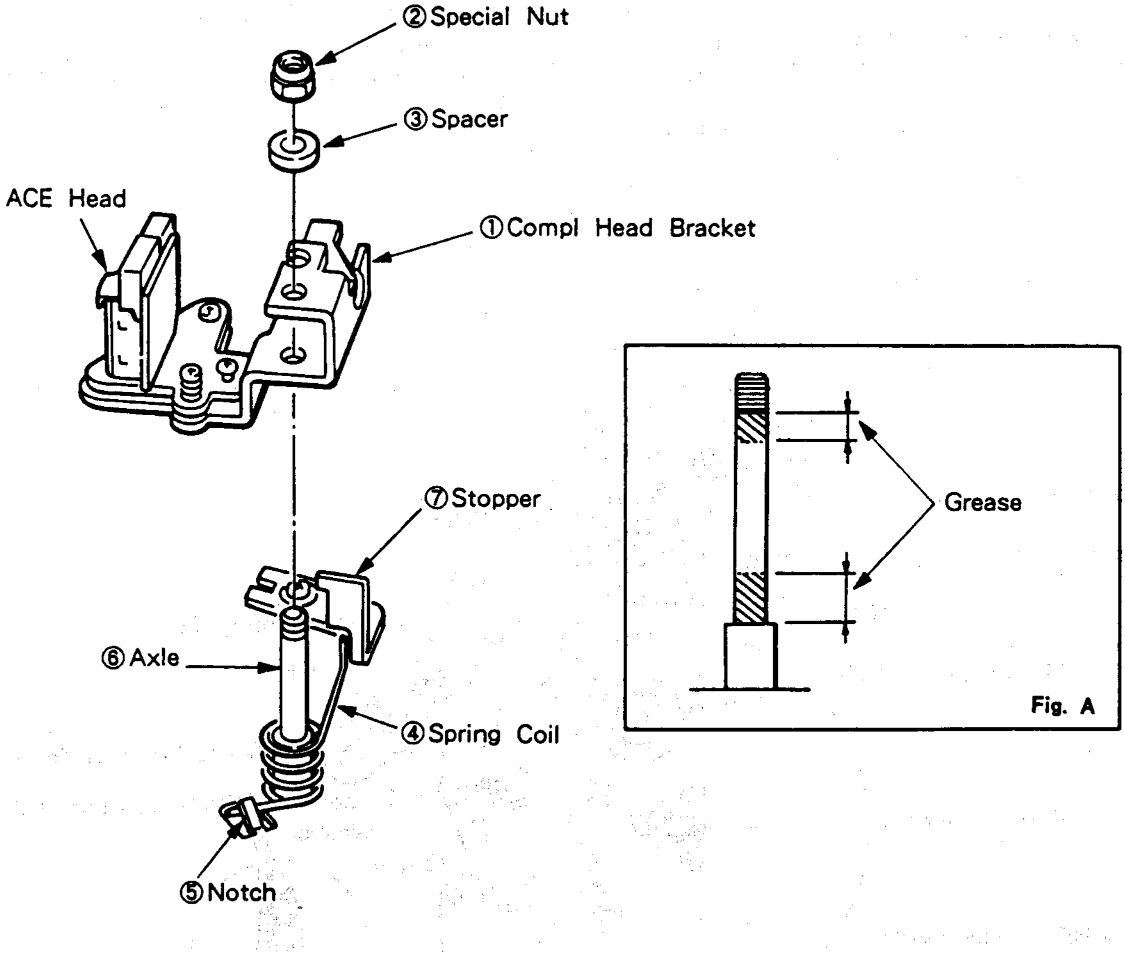

②Special Nut
③Spacer
ACE Head
①Compl Head Bracket
⑦Stopper
⑥Axle
④Spring Coil
⑤Notch
Grease
Fig. A

Fig. 5-5-1. Compl Head Bracket (ACE Head)

5-6. PINCH ROLLER PRESSURE MECHANISM (See Fig. 5-6-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the COMPL HEAD BRACKET as instructed in 5-5.
3) Remove the PINCH SPRING COIL ①.
4) Remove the special washer ②, then remove the PINCH LEVER ASS'Y ③.
5) Remove the REV GUIDE LEVER SPRING COIL ④.
6) Remove the REV GUIDE LEVER ASS'Y ⑥ from the plastic molding bearing hook ⑤ at the bottom. Take care not to open the hook too much, otherwise it may be deformed or broken.
7) Remove the LINK LOCK SPRING COIL ⑦.
8) Remove the special washer ⑧, then remove the PINCH CAM LEVER ASS'Y ⑨.
9) Remove the ACT PINCH SLIDE ASS'Y ⑩.

2. Remounting

1) Apply grease to pins ⑫/⑬ and axles ⑯/⑱.
2) Apply grease to the ACT PINCH SLIDE ASS'Y pin ⑰.
3) Set the INITIAL mode with the mode selector (VHJ-0050).
4) Mount the ACT PINCH SLIDE ASS'Y ⑩ onto pins ⑫ and ⑬.
5) Insert the pin ⑭ of the PINCH CAM LEVER ASS'Y ⑨ into the MAIN CAM ⑪ GROOVE 1, and mount onto the axle ⑯ while inserting the pin ⑰ of the ACT PINCH SLIDE ASS'Y into the hole ⑮.
6) Mount the special washer ⑧ onto the axle ⑯.
7) Hook the LINK LOCK SPRING COIL ⑦ to the PINCH CAM LEVER ASS'Y ⑨.
8) Mount the REV GUIDE LEVER ASS'Y ⑥ to the plastic molding bearing, then fix it with the hook ⑤ at the bottom.
9) Hook the REV GUIDE LEVER SPRING COIL ④.
10) Mount the PINCH LEVER ASS'Y ③ to the axle ⑱.
11) Mount the special washer ② to the axle ⑱.
12) Hook the PINCH SPRING COIL ① between the ACT PINCH SLIDE ASS'Y ⑩ and the PINCH LEVER ASS'Y ③.
13) Mount the COMPL HEAD BRACKET as instructed in 5-5.
14) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
15) Perform ACE head adjustment as instructed in 6-4.

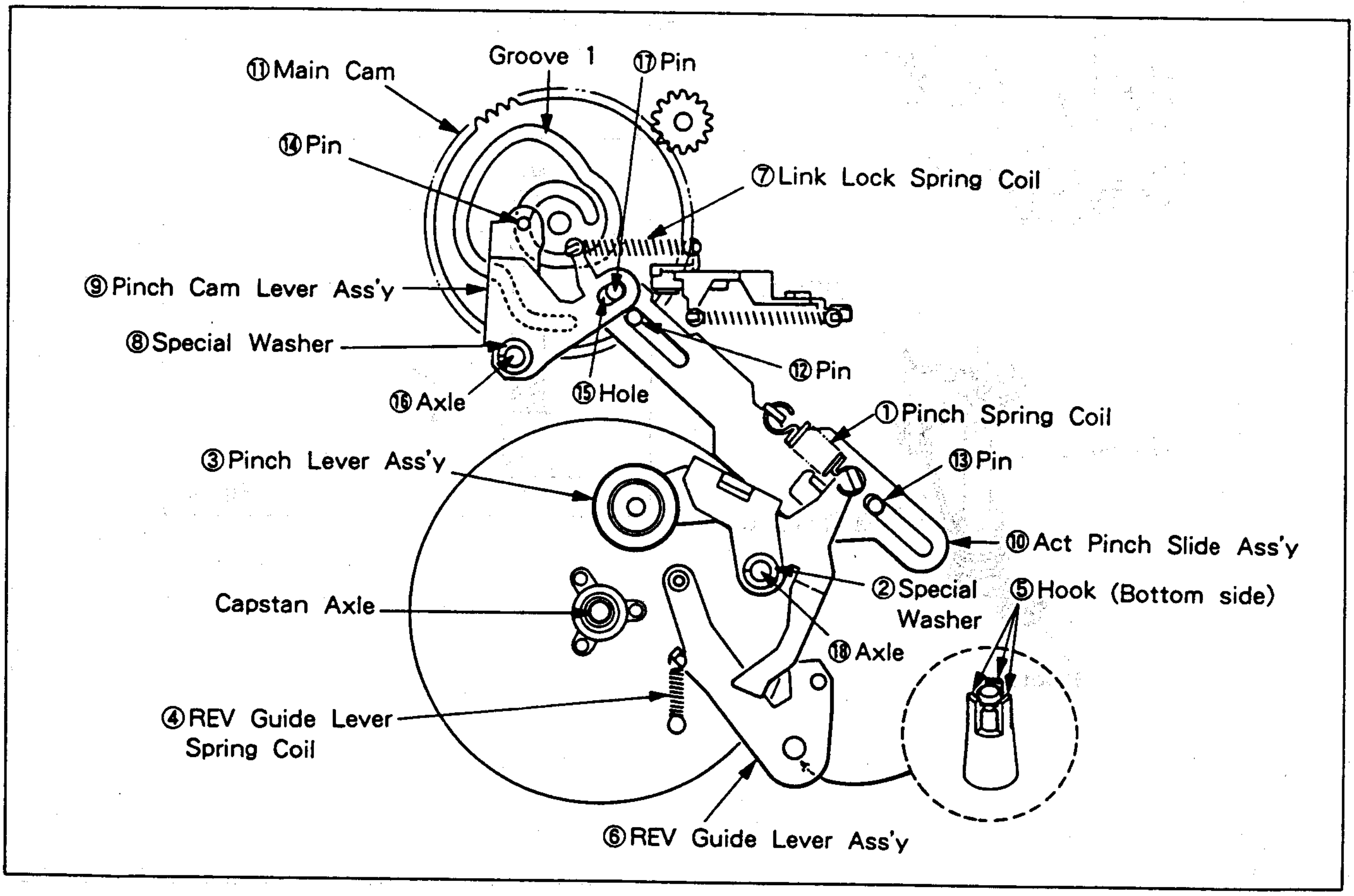

⑪Main Cam
Groove 1
⑰Pin
⑭Pin
⑦Link Lock Spring Coil
⑨Pinch Cam Lever Ass'y
⑧Special Washer
⑫Pin
⑯Axle
⑮Hole
①Pinch Spring Coil
③Pinch Lever Ass'y
⑬Pin
⑩Act Pinch Slide Ass'y
Capstan Axle
②Special Washer
⑤Hook (Bottom side)
⑱Axle
④REV Guide Lever Spring Coil
⑥REV Guide Lever Ass'y

Fig. 5-6-1. Pinch Roller Pressing Mechanism

5-7. BRAKE MECHANISM

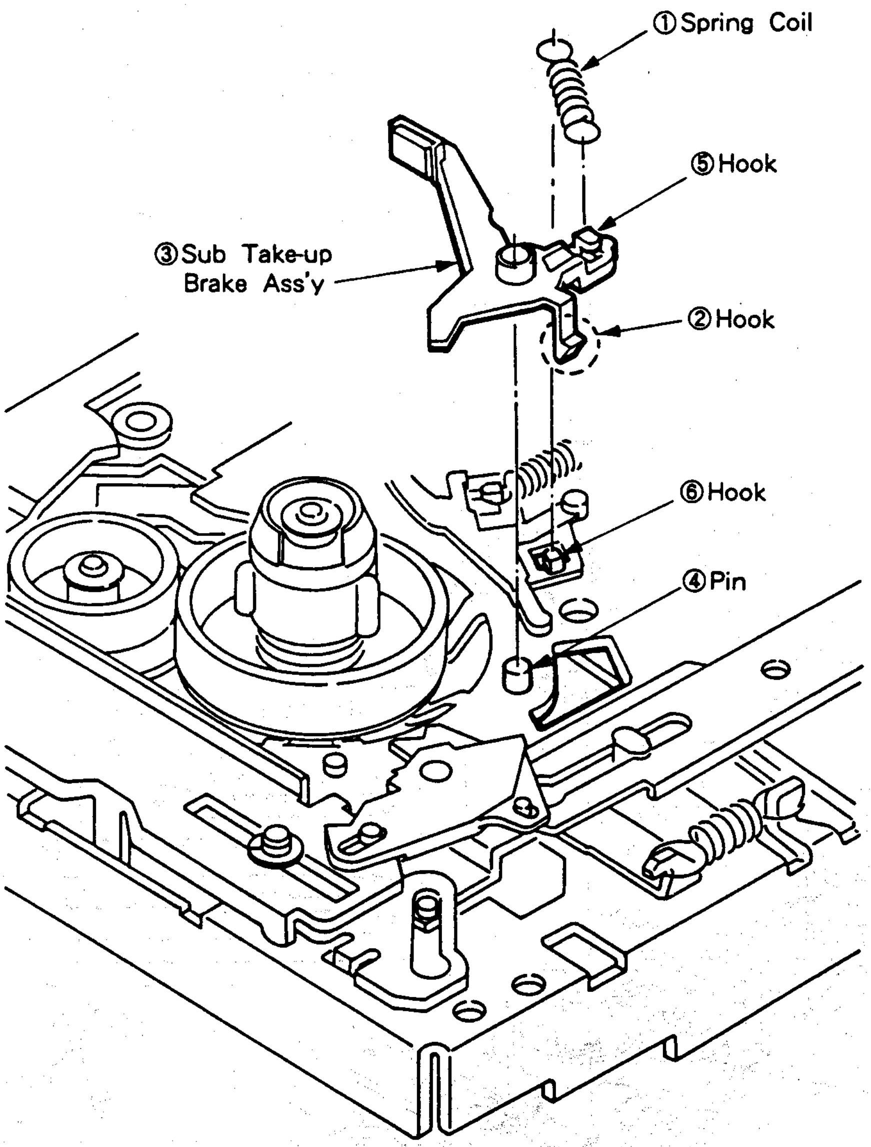
5-7-1. Sub Take-up Brake Ass'y (See Fig. 5-7-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SPRING COIL ①.
3) While pushing the hook ② in the direction of arrow, remove the SUB TAKE-UP BRAKE ASS'Y ③.

2. Remounting

1) Mount the SUB TAKE-UP BRAKE ASS'Y ③ onto the pin ④. Confirm that the hook ② is firmly hooked to the chassis.
2) Fit the SPRING COIL between hooks ⑤ and ⑥.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.



①Spring Coil
⑤Hook
③Sub Take-up Brake Ass'y
②Hook
⑥Hook
④Pin

Fig. 5-7-1. Sub Take-up Brake Ass'y

5-7-2. Supply Brake Ass'y and Take-up Brake Ass'y (See Fig. 5-7-2.)

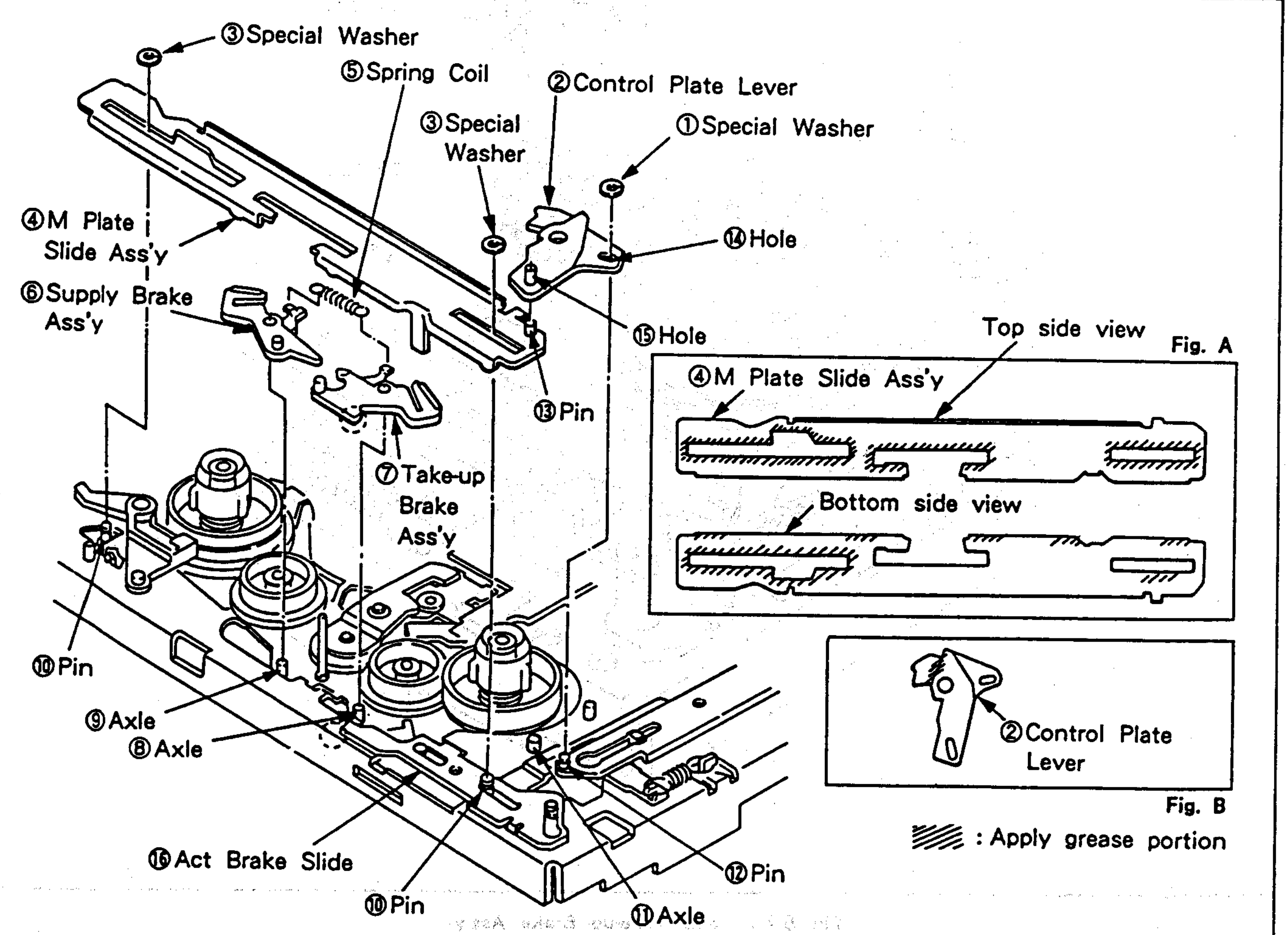
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SUB TAKE-UP BRAKE as instructed in 5-7-1.
3) Remove the special washer ①, then remove the CONTROL PLATE LEVER ②.
4) Remove the two special washers ③, then remove the M PLATE SLIDE ASS'Y ④.
5) Remove the SPRING COIL ⑤.
6) Remove the SUPPLY BRAKE ASS'Y ⑥ and the TAKE-UP BRAKE ASS'Y ⑦.

Note : Take care not to soil the brake shoes.

2. Remounting

1) Apply a thin layer of grease to axles ⑧ and ⑨.
2) Mount the TAKE-UP BRAKE ASS'Y ⑦ onto the axle ⑧.
3) Mount the SUPPLY BRAKE ASS'Y ⑥ onto the axle ⑨.
4) After applying a thin layer of grease to the M PLATE SLIDE ASS'Y ④ as shown in Fig. A, mount it onto the two pins ⑩.
5) Mount the two special washers ③ onto the two pins ⑩.
6) After applying grease to the CONTROL PLATE LEVER ② as shown in Fig. B, mount it onto the axle ⑪. Insert the ACT PLATE SLIDE ASS'Y pin ⑫ into the hole ⑭, and the M PLATE SLIDE ASS'Y pin ⑬ into the hole ⑮.
7) Mount the special washer ① onto the pin ⑫.
8) Mount the SUB TAKE-UP BRAKE as instructed in 5-7-1.
9) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.


③Special Washer
⑤Spring Coil
②Control Plate Lever
③Special Washer
①Special Washer
④M Plate Slide Ass'y
⑭Hole
⑥Supply Brake Ass'y
⑮Hole
Top side view
Fig. A
④M Plate Slide Ass'y
⑬Pin
⑦Take-up Brake Ass'y
Bottom side view
⑩Pin
②Control Plate Lever
⑨Axle
⑧Axle
Fig. B
▨ : Apply grease portion
⑯Act Brake Slide
⑫Pin
⑩Pin
⑪Axle

When assembling, the contact surfaces of Take-up Break ⑦ and the Break Slide ⑯ marked with ◌ should contact but not overlap each other.

Fig. 5-7-2. Supply Brake Ass'y & Take-up Brake Ass'y

5-7-3. Tension Lever Ass'y and Band Holder Ass'y (See Fig. 5-7-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SPRING COIL ①.
3) Remove the screw ③ fixing the BAND HOLDER ASS'Y ②.
4) Push the SUB SUPPLY BRAKE ④ in the direction of the arrow A, setting the BAND HOLDER ASS'Y ② free.
5) Open the hook ⑤ a little and remove the TENSION LEVER ASS'Y ⑥. Take care not to open the hook ⑤ too much, otherwise it may be deformed or broken.
6) Remove the hook ⑦ of the BAND HOLDER ASS'Y.

2. Remounting

1) Mount the BAND HOLDER ASS'Y hook ⑦ into the TENSION LEVER ASS'Y hole ⑧.
2) Insert the TENSION LEVER ASS'Y axle ⑨ into the hole ⑩ and confirm that the hook ⑤ is hooked.
3) While pushing the SUB SUPPLY BRAKE ④ in the direction of arrow, mount the BAND HOLDER ASS'Y ② with the screw ③.
4) Hook the SPRING COIL ① between the hooks ⑪ and ⑫.
5) Perform TENSION POLE position adjustment as instructed in 6-3.
6) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

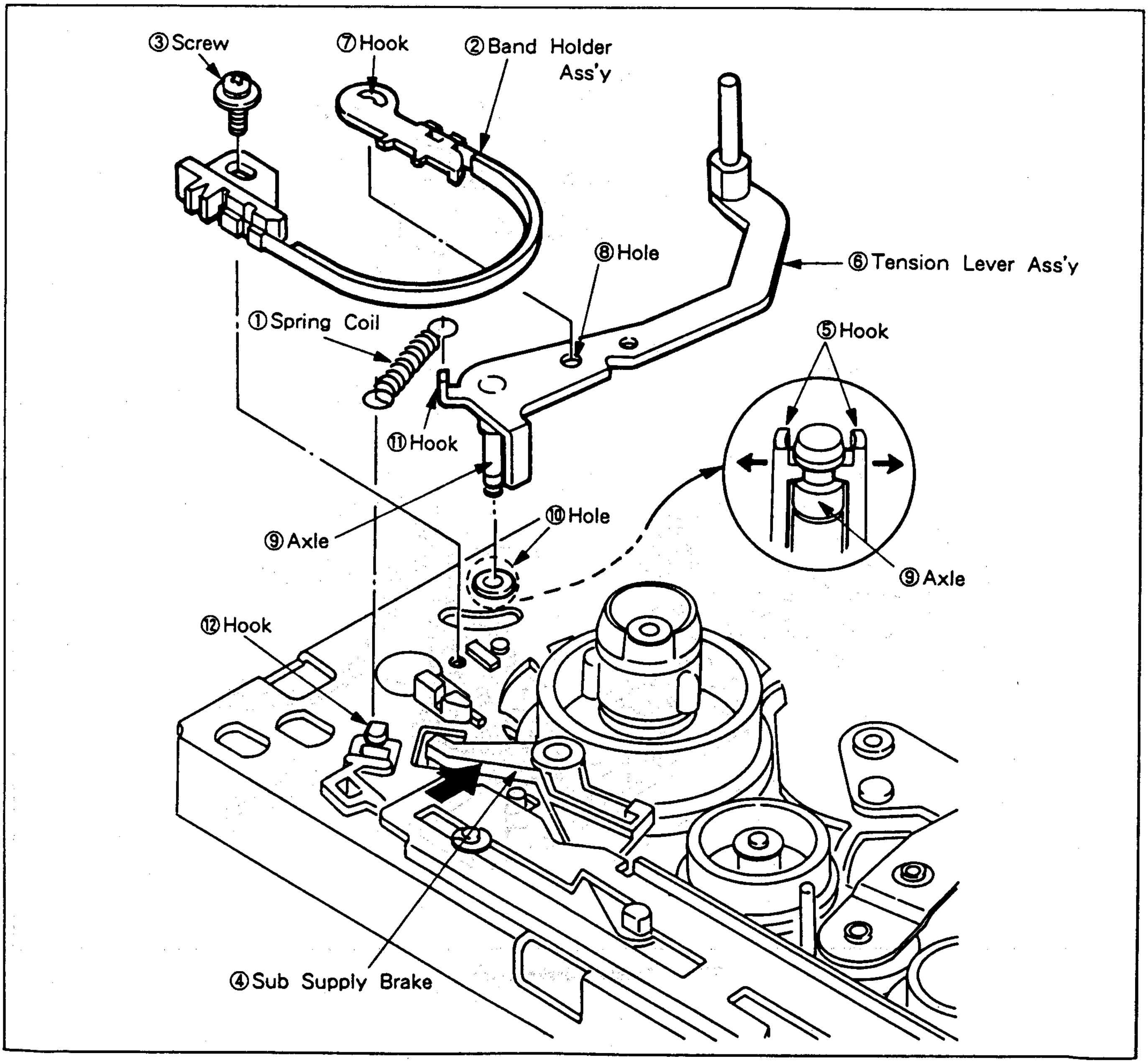

③Screw
⑦Hook
②Band Holder Ass'y
⑧Hole
⑥Tension Lever Ass'y
①Spring Coil
⑤Hook
⑪Hook
⑩Hole
⑨Axle
⑨Axle
⑫Hook
④Sub Supply Brake

Fig. 5-7-3. Tension Lever Ass'y & Band Holder Ass'y

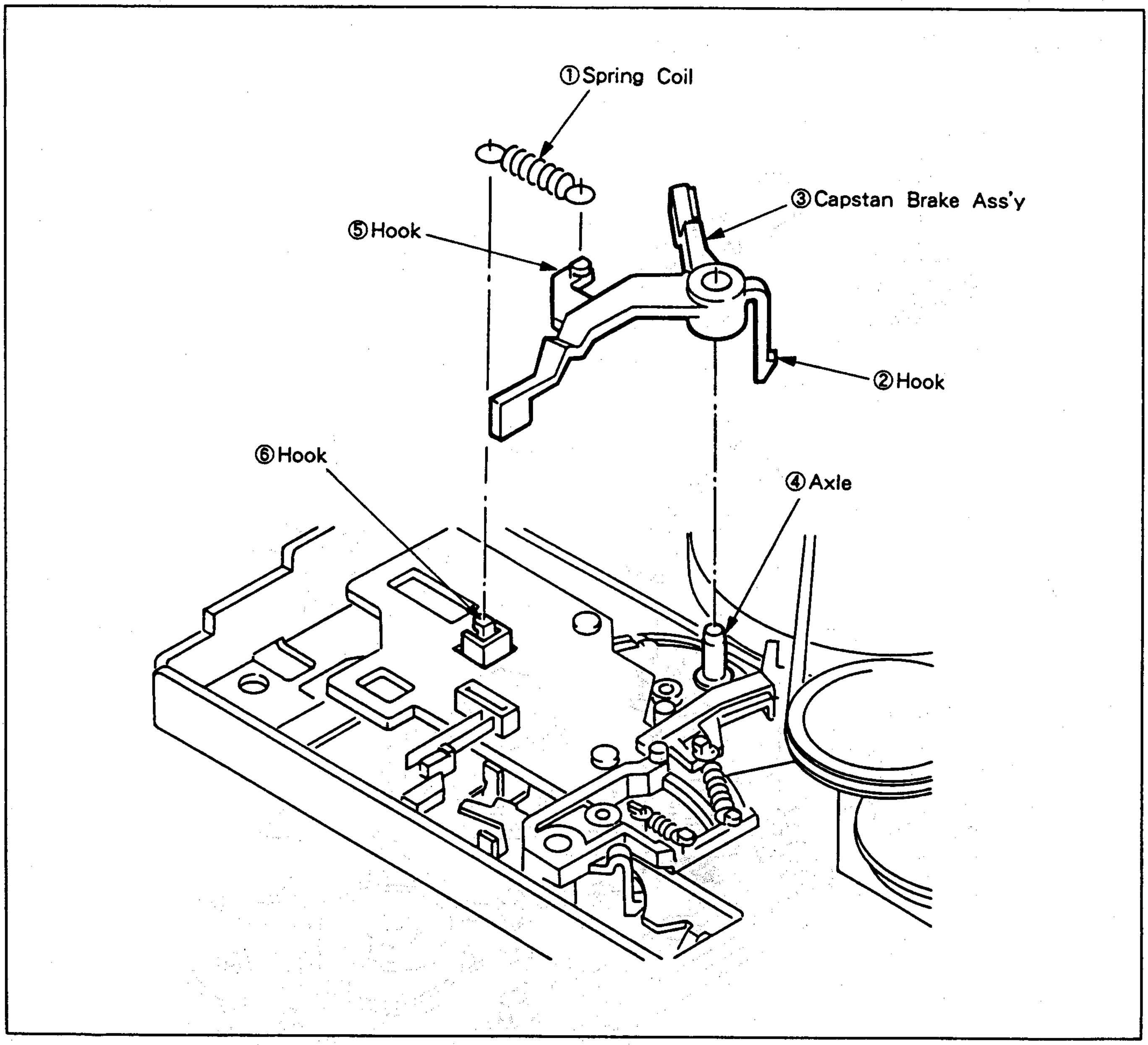
5-7-4. Capstan Brake Ass'y (See Fig. 5-7-4.)

1. Removal

1) Remove the SPRING COIL ①.
2) Unhook the hook ②, then remove the CAPSTAN BRAKE ASS'Y ③.

2. Remounting

1) Mount the CAPSTAN BRAKE ASS'Y ③ onto the axle ④. Confirm that the hook ② is hooked to the chassis.
2) Hook the SPRING COIL ① between hooks ⑤ and ⑥. Fix the hook ⑥ side with adhesive (use an adhesive that allows later detaching).


①Spring Coil
③Capstan Brake Ass'y
⑤Hook
②Hook
⑥Hook
④Axle

5-7-4. Capstan Brake Ass'y

5-8. REEL TABLE DRIVE MECHANISM

5-8-1. Supply Reel Ass'y and Supply Reel Gear (See Fig. 5-8-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the BAND HOLDER ASS'Y as instructed in 5-7-3.
3) Set the PLAY mode with the mode selector (VHJ-0050).
4) Remove the special washer ①, then remove the SUPPLY REEL ASS'Y ② and the washer ③.
5) Remove the special washer ④.
6) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, remove the SUPPLY REEL GEAR ⑥ and the washer ⑦.

Note : Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑧ indicated by the arrow B, then mount the washer ⑦.
2) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, mount the SUPPLY REEL GEAR ⑥ onto the axle ⑧.
3) Mount the special washer ④ to the axle ⑧.
4) Apply 1 drop of oil to the part of the axle ⑨ indicated by the arrow C, then mount the washer ③.
5) Mount the SUPPLY REEL ASS'Y ② onto the axle ⑨.
6) Perform reel table height adjustment as instructed in 6-2-1.
7) Mount the special washer ① onto the axle ⑨.
8) Mount the BAND HOLDER ASS'Y as instructed in 5-7-3.
9) Perform tension pole position adjustment as instructed in 6-3.
10) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

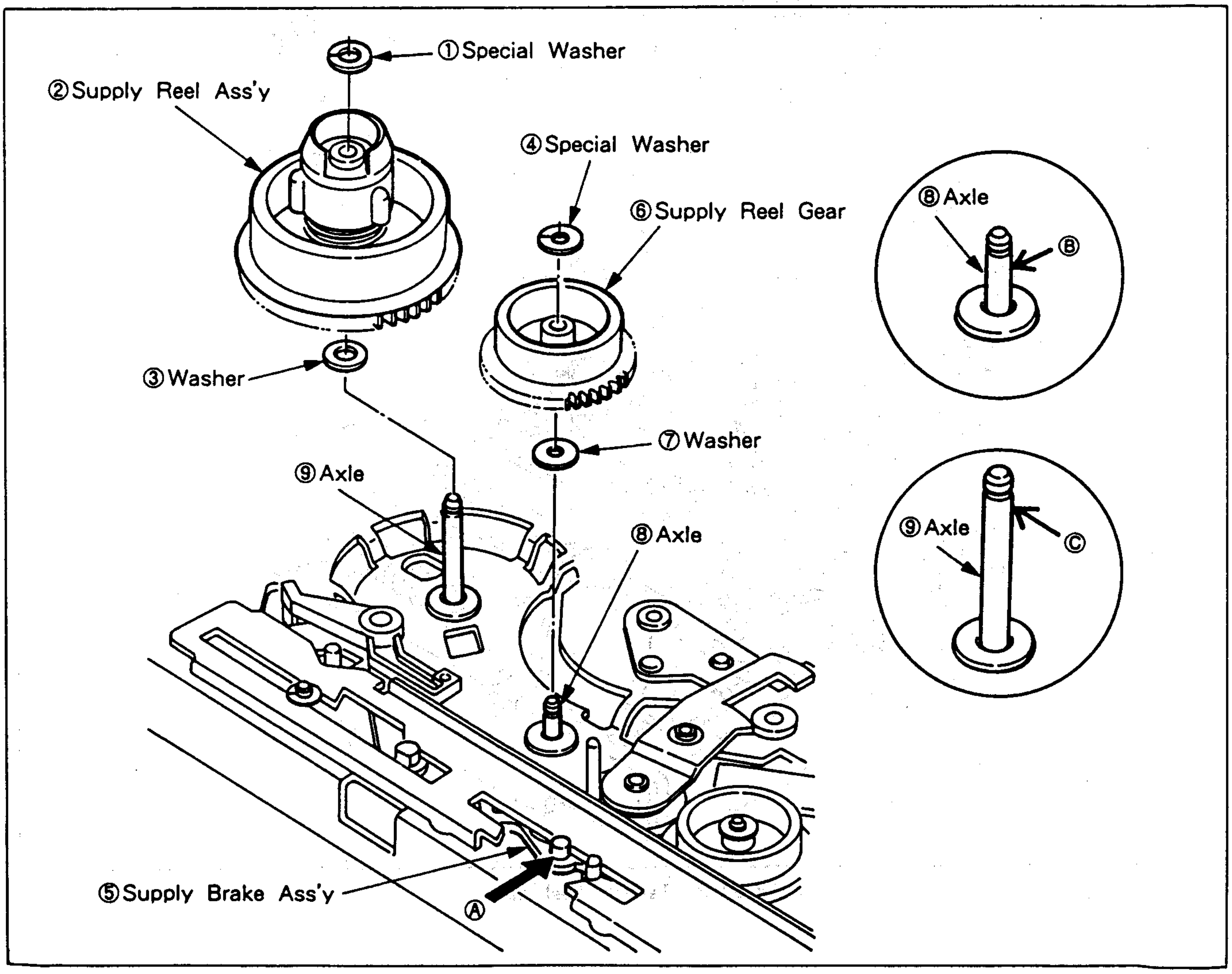


Fig. 5-8-1. Supply Reel Ass'y & Supply Reel Gear

5-8-2. Take-up Reel Ass'y (See Fig. 5-8-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the special washer ①.
3) Push the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A to release the brake, then remove the TAKE-UP REEL ASS'Y ③ and the washer ④.

Note : Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply 1 drop of oil to the part of the axle ⑤ indicated by the arrow B, then mount the washer ④.
2) While pushing the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A, mount the TAKE-UP REEL ASS'Y ③ onto the axle ⑤.
3) Perform reel table height adjustment as instructed in 6-2.
4) Mount the special washer ① onto the axle ⑤.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

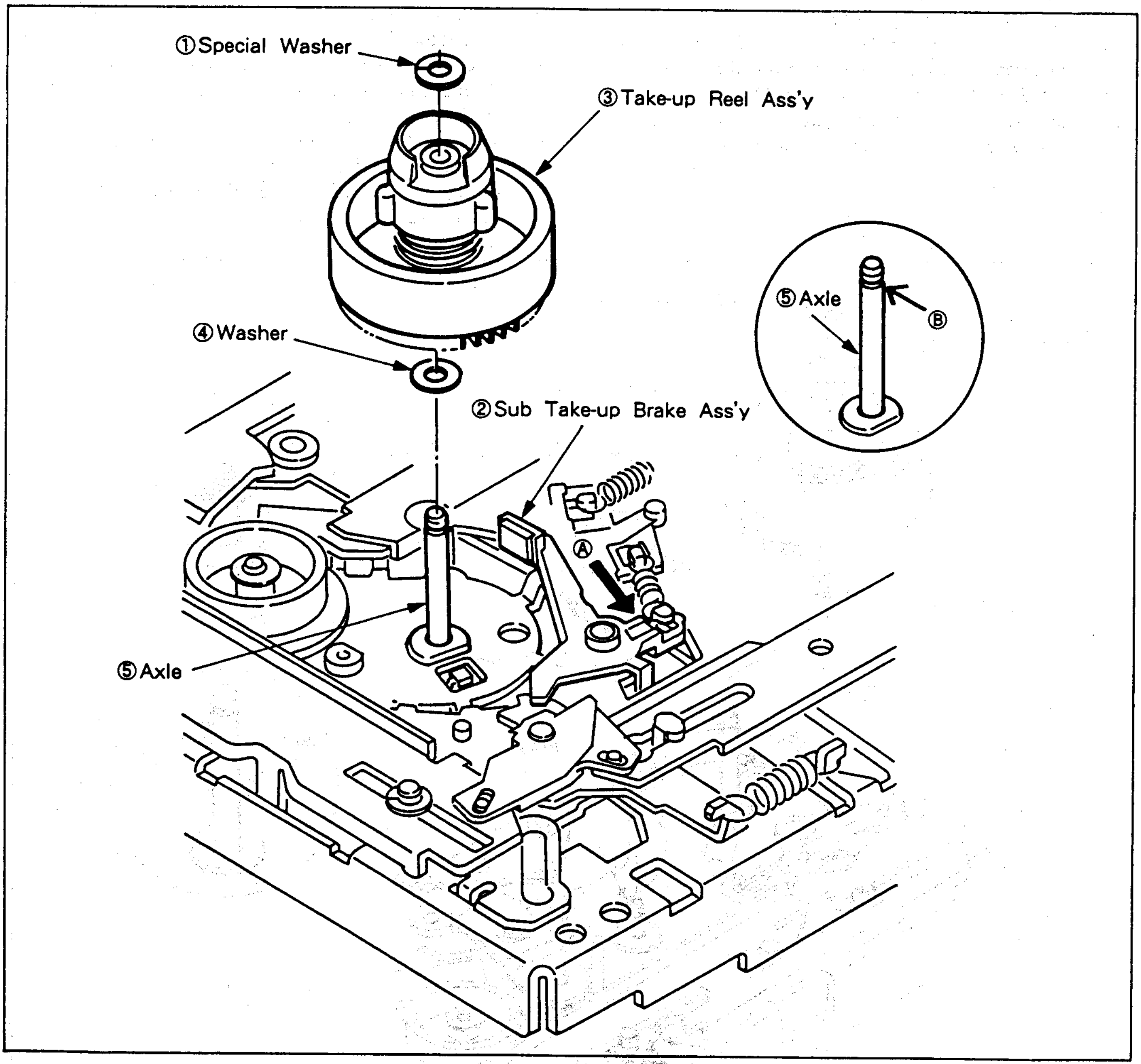


Fig. 5-8-2. Take-up Reel Ass'y

5-8-3. Take-up Reel Gear (See Fig. 5-8-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the TAKE-UP REEL ASS'Y as instructed in 5-8-2.
3) Remove the SUB TAKE-UP BRAKE ASS'Y as instructed in 5-7-1.
4) Remove the TAKE-UP BRAKE ASS'Y as instructed in 5-7-2.
5) Remove the special washer ①, then remove the TAKE-UP REEL GEAR ③ and the washer ④.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑤ indicated with an arrow.
2) Mount the washer ④ and the TAKE-UP REEL GEAR ③ onto the axle ⑤.
3) Mount the special washer ① onto the axle ⑤.
4) Mount the TAKE-UP BRAKE ASS'Y as instructed in 5-7-2.
5) Mount the SUB TAKE-UP BRAKE ASS'Y as instructed in 5-7-1.
6) Mount the TAKE-UP REEL ASS'Y as instructed in 5-8-2.
7) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

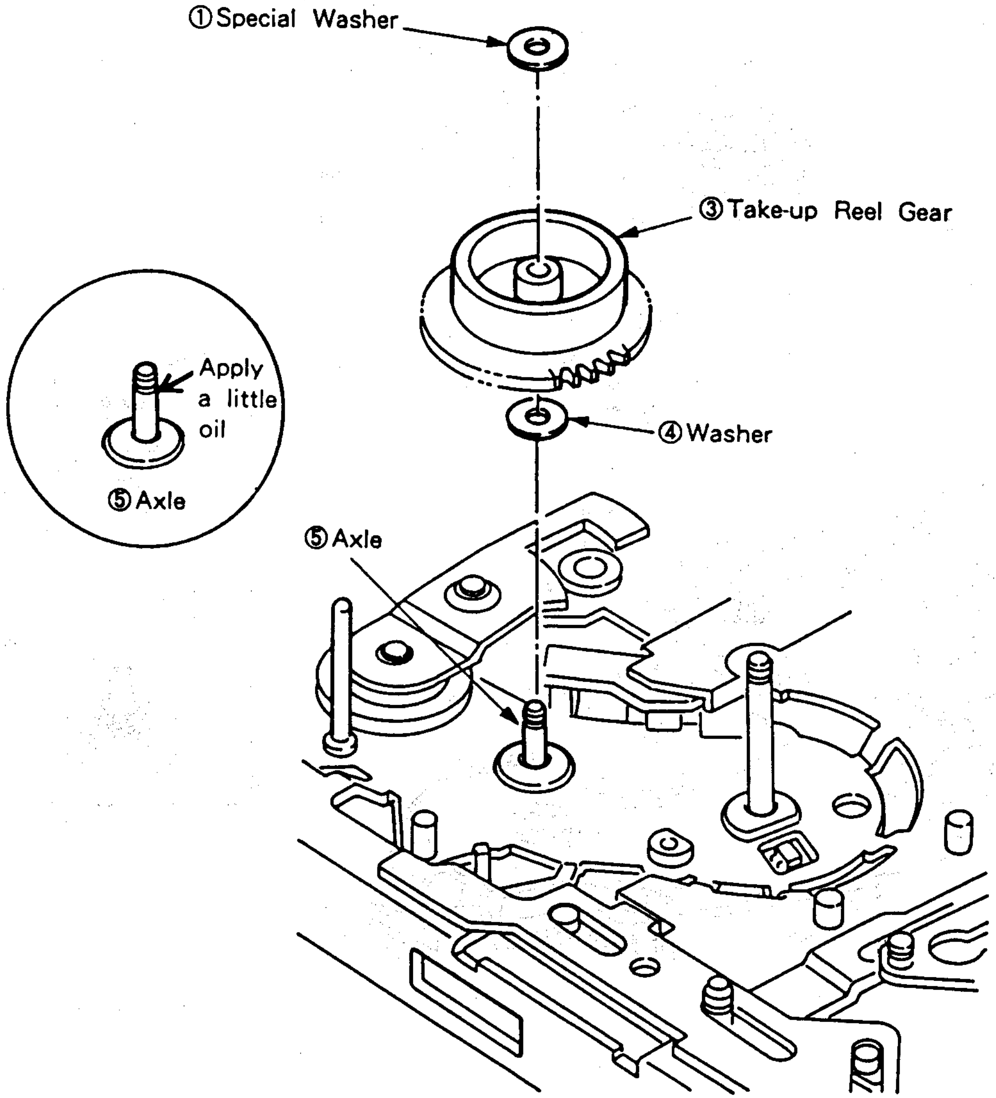


Fig. 5-8-3. Take-up Reel Gear

5-8-4. Reel Pulley and Friction Gear Ass'y (See Fig. 5-8-4.)

1. Removal

1) Remove the two screws ①, then remove the PULLEY BRACKET ②.
2) Remove the REEL DRIVE BELT ③.
3) Remove the special washer ④, then remove the REEL PULLEY ⑤.
4) Remove the special washer ⑥, then remove the FRICTION GEAR ASS'Y ⑦ and the washer ⑧.

2. Remounting

1) Apply one drop of oil to the parts of axles ⑨ and ⑩ indicated with an arrow.
2) Mount the washer ⑧ and the FRICTION GEAR ASS'Y ⑦ onto the axle ⑨.
3) Mount the special washer ⑥ onto the axle ⑨.
4) Mount the REEL PULLEY ⑤ onto the axle ⑩.
5) Mount the special washer ④ onto the axle ⑩.
6) Set the REEL DRIVE BELT ③.
7) Mount the PULLEY BRACKET ② with the two screws ①.

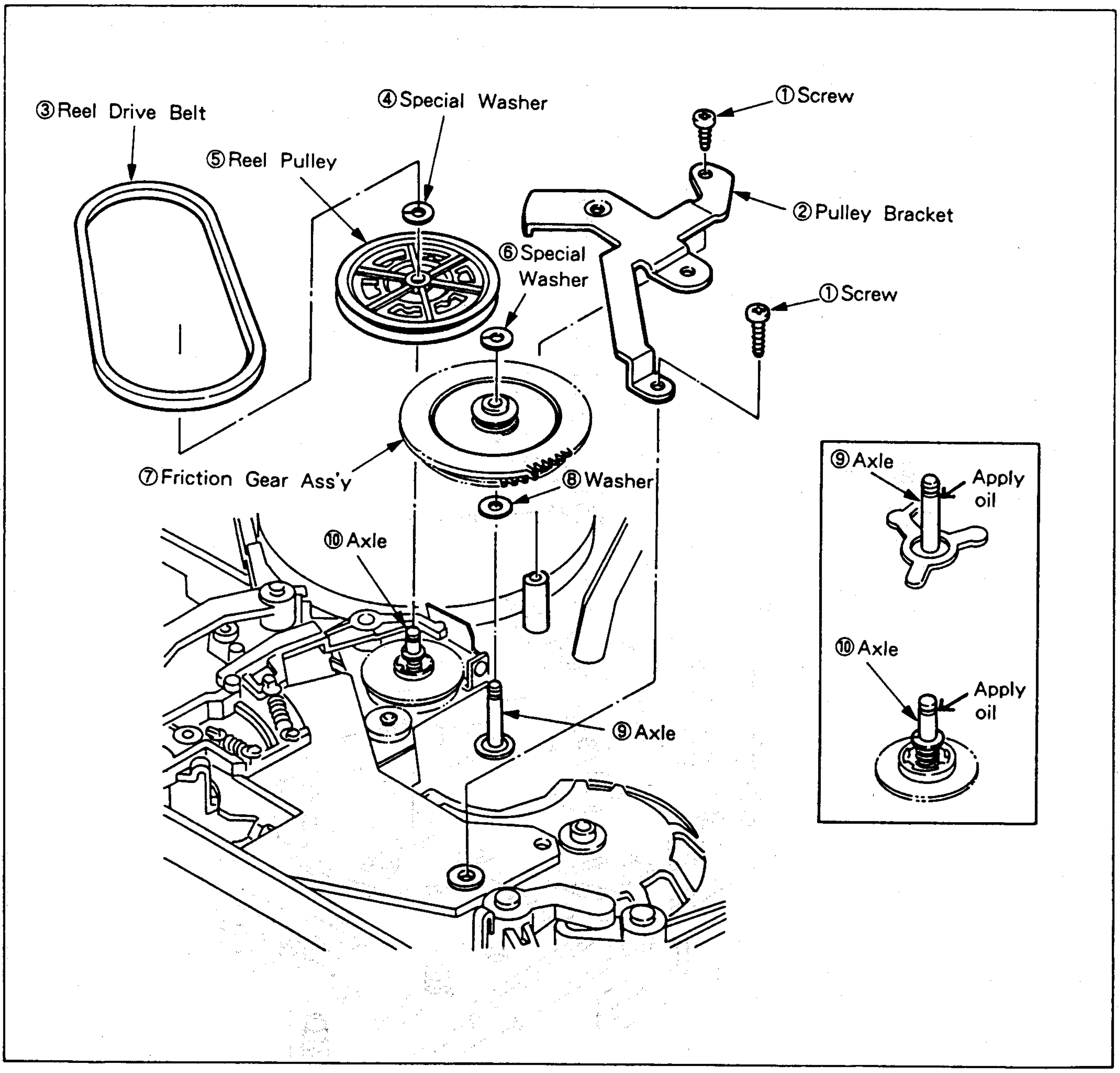

③Reel Drive Belt
④Special Washer
①Screw
⑤Reel Pulley
②Pulley Bracket
⑥Special Washer
①Screw
⑦Friction Gear Ass'y
⑧Washer
⑩Axle
⑨Axle
⑨Axle
Apply oil
⑩Axle
Apply oil
⑨Axle

Fig. 5-8-4. Reel Pulley & Friction Gear

5-8-5. COMPL Clutch (See Fig. 5-8-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
3) Remove the screw ①, then remove the COMPL MC-4 ②.
4) Remove the two screws ③, then remove the COMPL CLUTCH ④.

2. Remounting

1) Mount the COMPL CLUTCH ④ with the two screws ③, aligning it with the protuberance ⑤.
2) After inserting the CN831 (COMPL MC-4) into the CN801 (COMPL MC-1), mount the COMPL MC-4 with the screw ①.
3) Mount the REEL PULLEY, the REEL DRIVE BELT and the PULLEY BRACKET as instructed in 5-8-4.
4) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

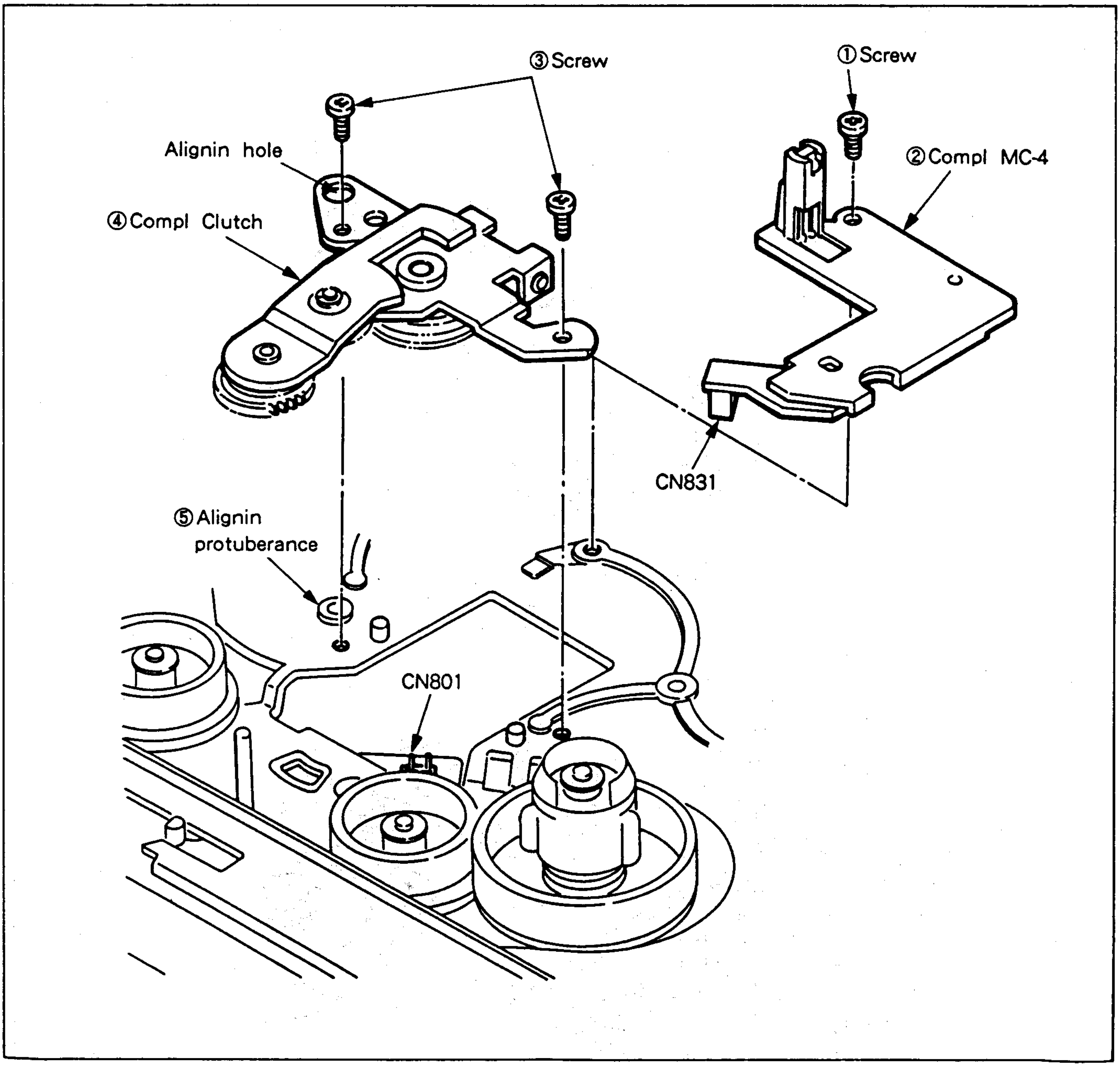

③Screw
①Screw
Alignin hole
②Compl MC-4
④Compl Clutch
CN831
⑤Alignin protuberance
CN801

Fig. 5-8-5. Compl Clutch

5-8-6. Clutch Change Lever and Clutch Lever Ass'y (See Fig. 5-8-6.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
3) Remove the SPRING COIL ①.
4) Unhook the hook ②, then remove the CLUTCH CHANGE LEVER ③.
5) Remove the CS ring ④.
6) Unhook the hook ⑤, then remove the CLUTCH LEVER ASS'Y ⑥.

2. Remounting

1) Mount the CLUTCH LEVER ASS'Y ⑥ onto the axle ⑦. Confirm that the hook ⑤ is hooked to the chassis.
2) Mount the CS ring ④ onto the axle ⑦.
3) Mount the CLUTCH CHANGE LEVER ③ onto the axle ⑧. Confirm that the hook ② is hooked to the chassis.
4) Hook the SPRING COIL ① between the hooks ⑨ and ⑩.
5) Mount the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
6) Mount the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.

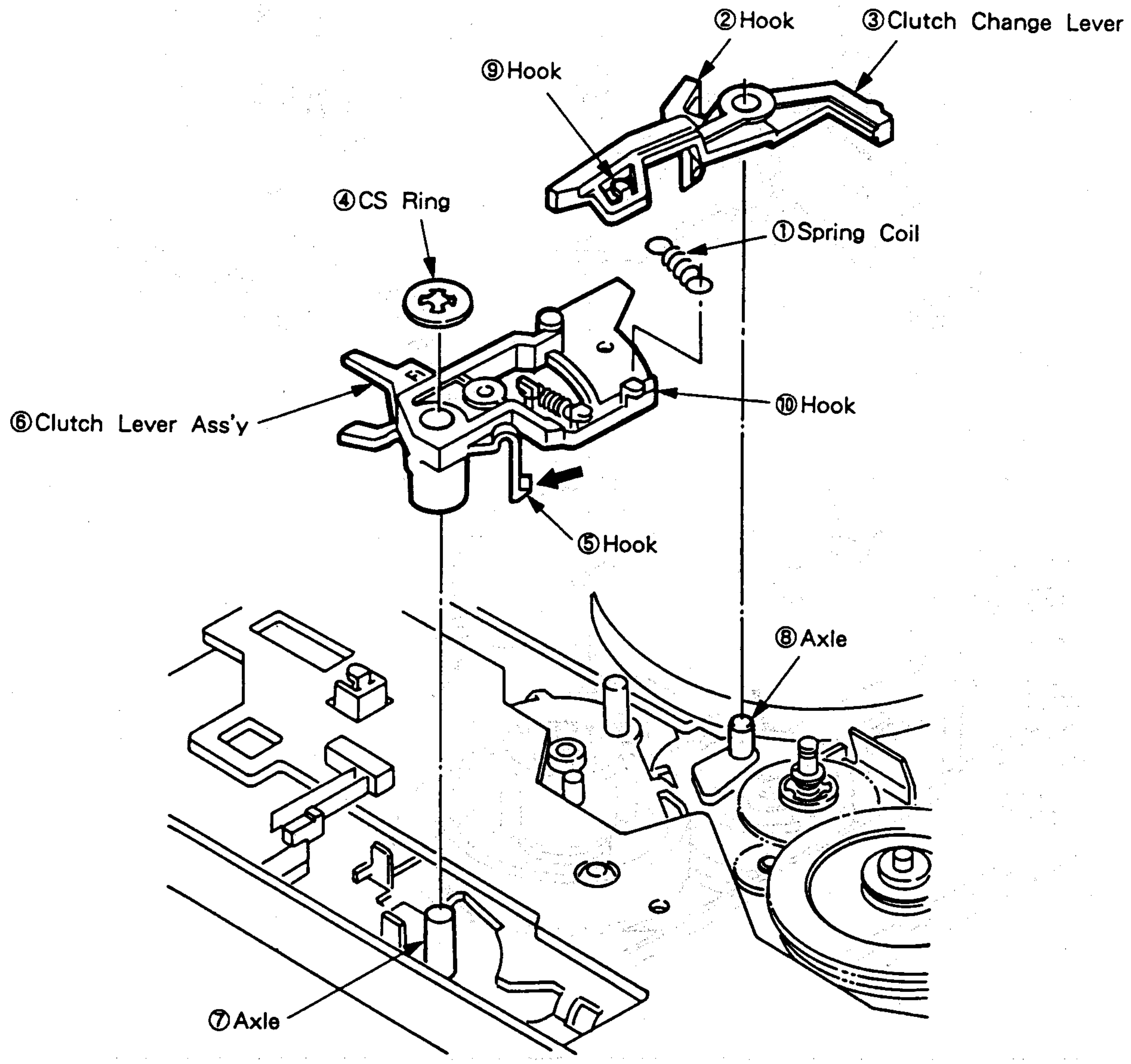

②Hook
③Clutch Change Lever
⑨Hook
④CS Ring
①Spring Coil
⑥Clutch Lever Ass'y
⑩Hook
⑤Hook
⑧Axle
⑦Axle

Fig. 5-8-6. Clutch Change Lever & Clutch Lever Ass'y

5-9. CAPSTAN MOTOR (See Fig. 5-9-1.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.
2) Remove the CAPSTAN MOTOR ⑥ connector.
3) Remove the REEL DRIVE BELT ② from the CAPSTAN MOTOR PULLEY ①.
4) Remove the two screws ④ fixing the COMPL CASSETTE MECHANISM TOP BOARD ③, then slide the TOP BOARD ③ backward.
5) Remove the three screws ⑤, then remove the CAPSTAN MOTOR ⑥.

Note : Take care not to scratch or soil the capstan axle.

2. Remounting

1) Mount the CAPSTAN MOTOR ⑥ with the three screws ⑤.
2) Connect the CAPSTAN MOTOR ⑥ connector.
3) Mount the TOP BOARD ③ with the two screws ④.
4) Fit the REEL DRIVE BELT ② around the CAPSTAN MOTOR PULLEY ① and the REEL PULLEY ⑦.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.

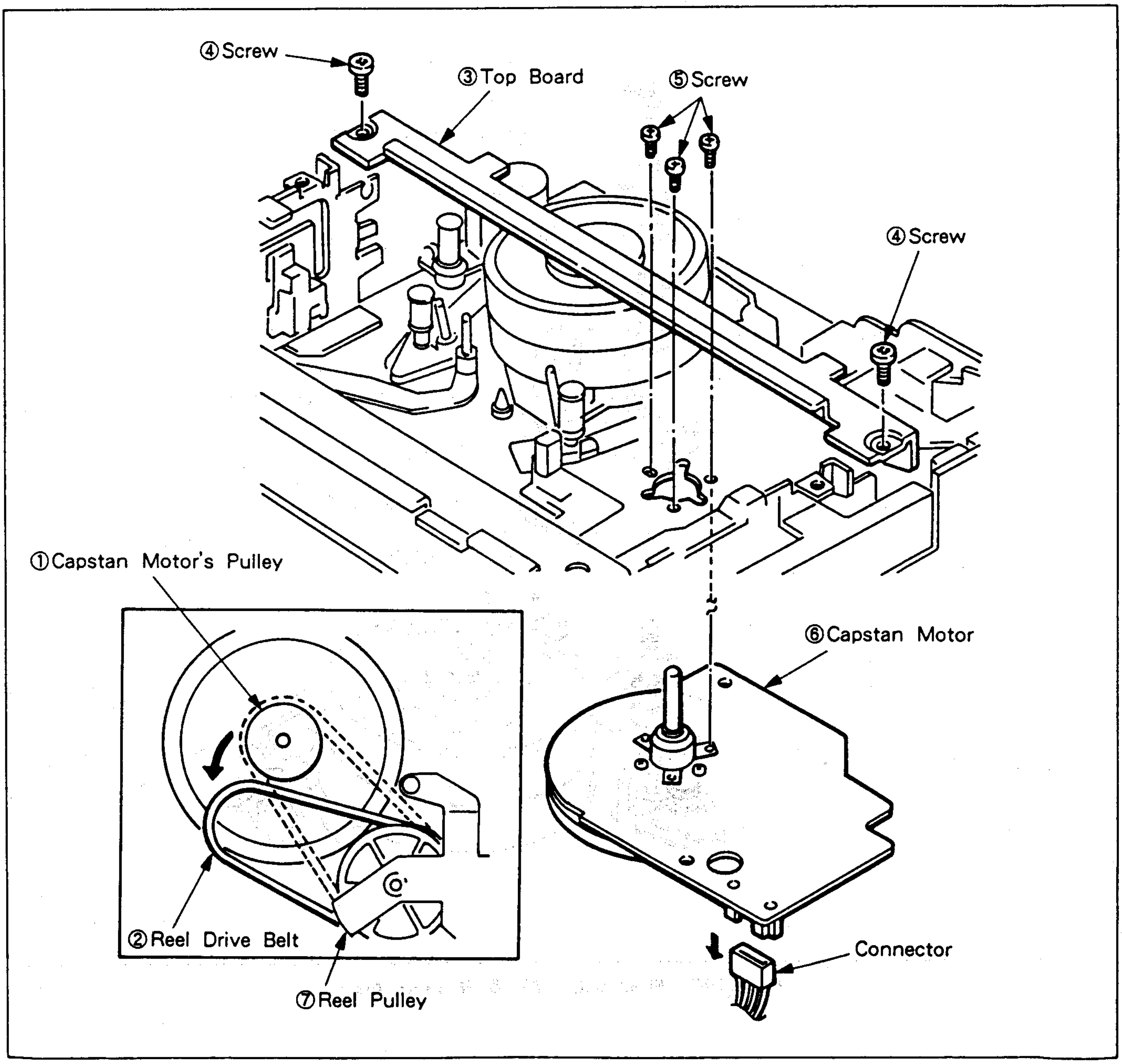

④Screw
③Top Board
⑤Screw
④Screw
①Capstan Motor's Pulley
⑥Capstan Motor
②Reel Drive Belt
⑦Reel Pulley
Connector

Fig. 5-9-1. Capstan Motor

5-10. FIXED GUIDE, FE HEAD LEVER ASS'Y

5-10-1. S-Side Fixed Guide and FE Lever Ass'y (See Fig. 5-10-1.)

1. Removal

1) Remove the SP NUT ①, then remove the SP washer ② (upper), the GUIDE PIPE ③, the SP washer ② (lower) and the SPRING COIL ④, in that order.
2) Remove the SPRING COIL ⑤.
3) Remove the FTE HEAD connector.
4) Remove the special washer ⑥, then remove the FE HEAD LEVER ASS'Y ⑦.

2. Remounting

1) After mounting the FE LEVER ASS'Y ⑦ onto the axle ⑧, mount the special washer ⑥.
2) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE LEVER ASS'Y hook ⑩.
3) Connect the SPRING COIL ④, the SP washer ② (lower), the GUIDE pipe ③, the SP washer ② (upper) and the SP NUT ① to the axle ⑧, in that order.
4) Connect the connector to the FTE HEAD.
5) Perform height adjustment of the fixed guide (S) as instructed in 6-4.

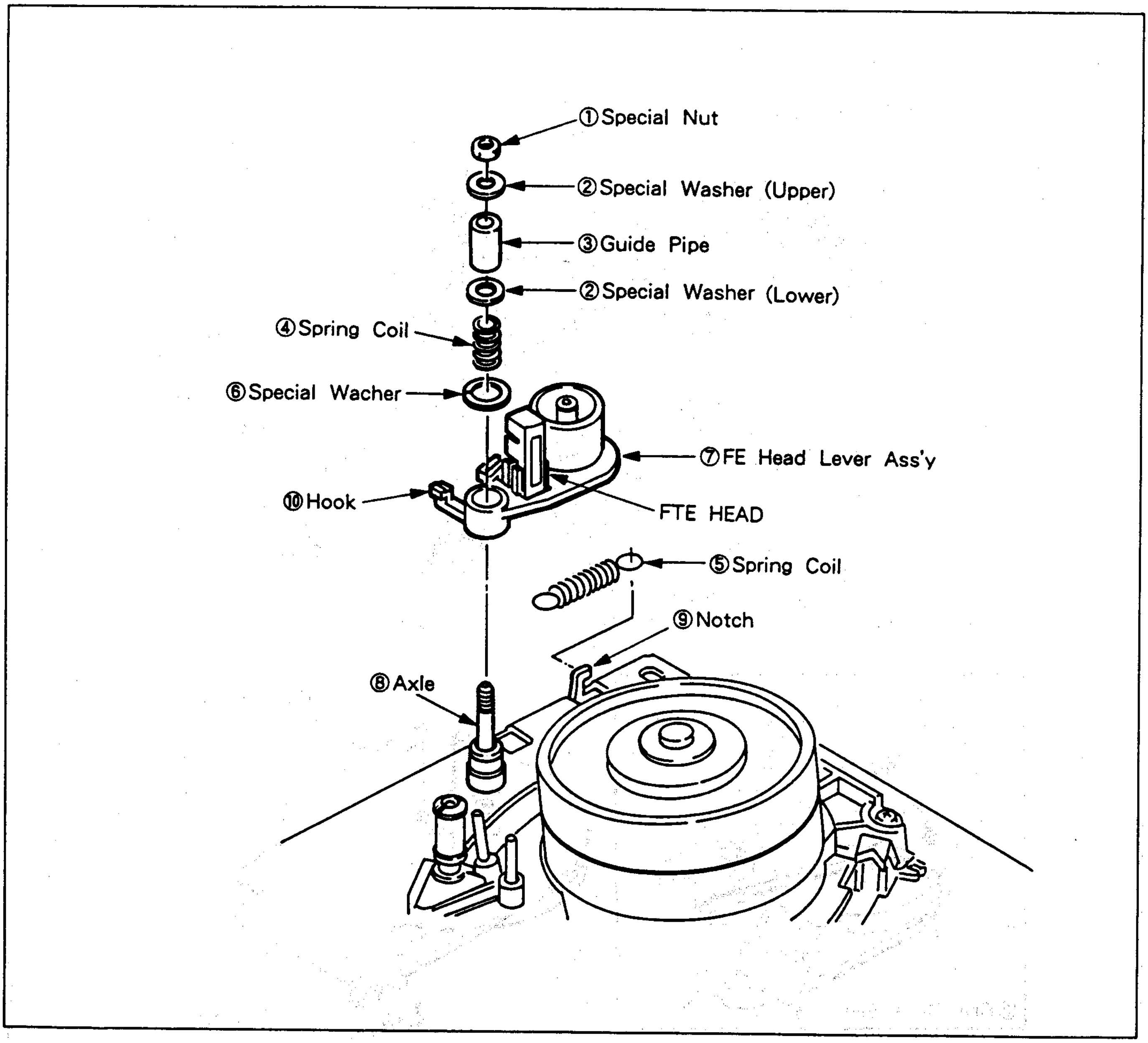

①Special Nut
②Special Washer (Upper)
③Guide Pipe
②Special Washer (Lower)
④Spring Coil
⑥Special Wacher
⑦FE Head Lever Ass'y
⑩Hook
FTE HEAD
⑤Spring Coil
⑨Notch
⑧Axle

Fig. 5-10-1. Fixed Guide (S) & FE Lever Ass'y

5-10-2. Impedance Roller, FTE Head (See Fig. 5-10-2.)

1. Removal

1) Remove the FTE HEAD (full track erase head) ① connector.
2) Remove the special washer ②, then remove the IMPEDANCE ROLLER ③ and the washer ④.
3) Open the hook ⑤ a little and remove the FTE HEAD ①.

Note : Take care not to open the hook too much, otherwise it may be deformed or broken.

2. Remounting

1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hook ⑤ is hooked to the FTE HEAD ①.
2) Mount the washer ④ and the IMPEDANCE ROLLER ③, in that order, onto the axle ⑦, then mount the special washer ②.
3) Connect the connector to the terminal of the FTE HEAD ①.

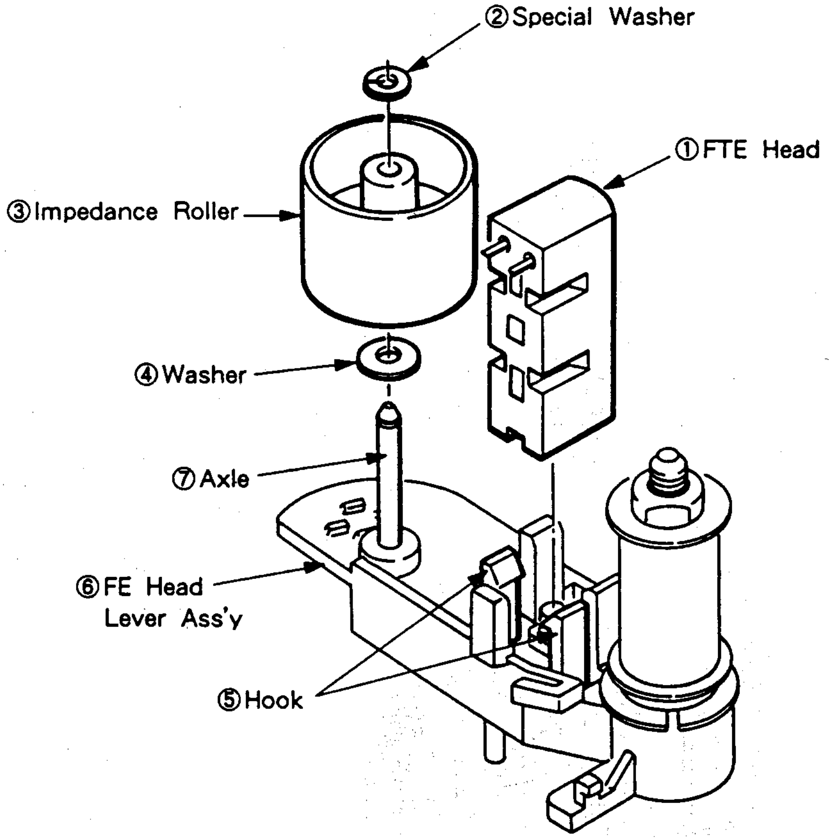

②Special Washer
①FTE Head
③Impedance Roller
④Washer
⑦Axle
⑥FE Head Lever Ass'y
⑤Hook

Fig. 5-10-2. Impedance Roller & FTE Head

5-10-3. Fixed (T) Guide (See Fig. 5-10-3.)

1. Removal

1) Remove the CAP ①.
2) Remove the SP NUT ②, then remove the SP washer ③ (upper), the GUIDE PIPE ④, the SP washer ③ (lower) and the SPRING COIL ⑤, in that order.

Note : Shape of the CAP differ from drawing in the figure depending on the model.

2. Remounting

1) Mount the SPRING COIL ⑤, the SP washer ③ (lower), the GUIDE PIPE ④, the SP washer ③ (upper) and the SP NUT ②, in that order, to the axle ⑥.
2) Mount the CAP ① onto the axle ⑥.
3) Perform height adjustment of the fixed guide (T) as instructed in 6-4.

Note : In some models, the CAP ① is attached to the SPRING GUIDE ⑦. In this case, place the SPRING GUIDE ⑦ into the guide hole ⑧ of the GUIDE BRACKET screwed to the COMPL CASSETTE MECHANISM as shown in Fig. A.

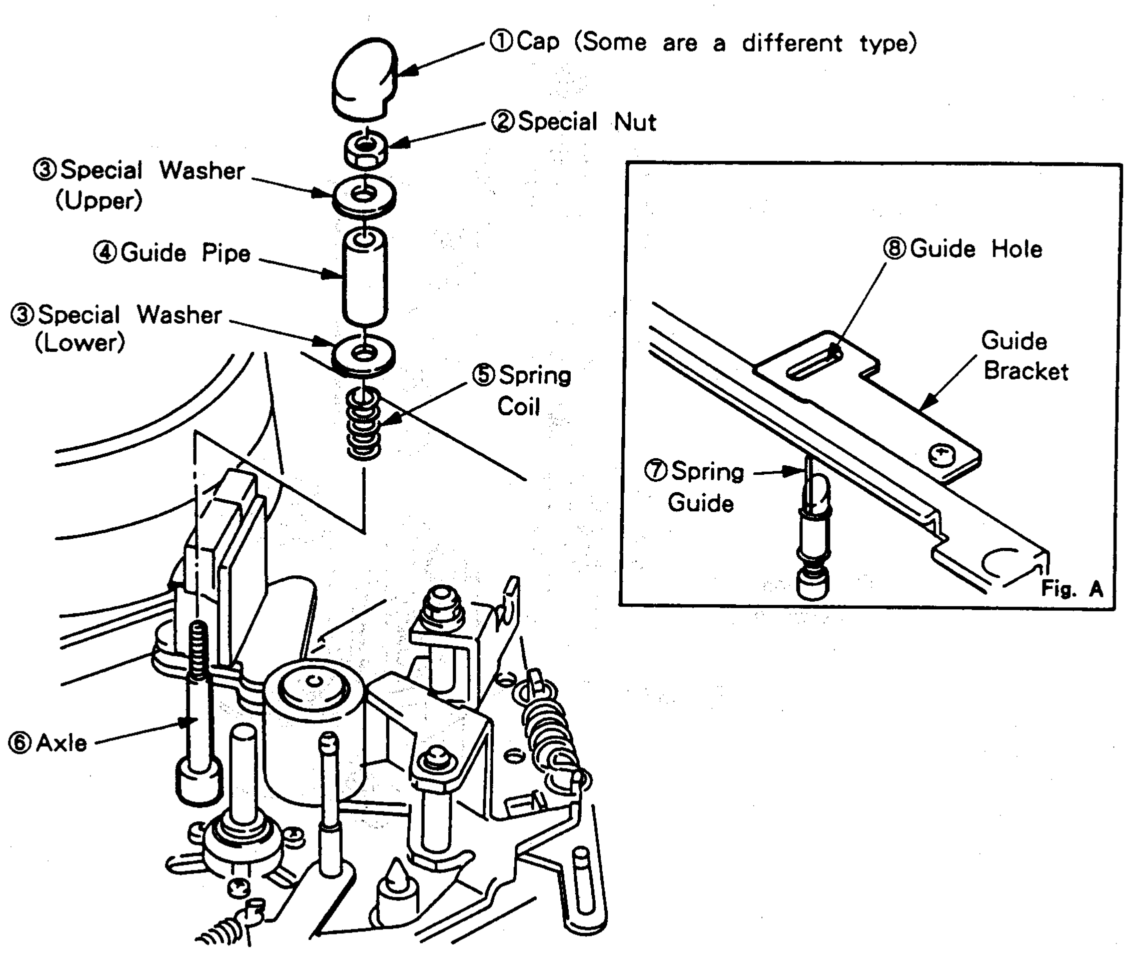

①Cap (Some are a different type)
②Special Nut
③Special Washer (Upper)
④Guide Pipe
③Special Washer (Lower)
⑤Spring Coil
⑥Axle
⑧Guide Hole
Guide Bracket
⑦Spring Guide
Fig. A

Fig. 5-10-3. Fixed Guide (T)

5-11. DRUM SECTION

5-11-1. Drum Motor (rotor, stator) (See Fig. 5-11-1.)

1. Removal

1) Remove the screw ①, then remove the CYLINDER EARTH ASS'Y ②.
2) Remove the two screws ③, then remove the ROTOR ④.
3) Remove the STATOR board connector.
4) Remove the three screws ⑤, then remove the STATOR ⑥.

2. Remounting

1) Mount the STATOR ⑥ with the three screws ⑤.
2) While aligning the ROTOR oval hole ⑦ with the ROTOR DISK hole ⑧, mount the ROTOR with the two screws ③.
3) Insert the connector ⑩.
4) While aligning the CYLINDER EARTH ASS'Y ② protuberance with the chassis hole ⑨, mount it with the screw ①.

Note 1 : Use a torque driver (VHJ-0014) for mounting the STATOR ⑥ and the ROTOR ④. Set fastening torque to 3kg-cm.

Note 2 : When the drum unit has been replaced, perform a tape path adjustment as instructed in 6-4. and perform a CH-1/CH-2 switching position adjustment of the servo circuit.

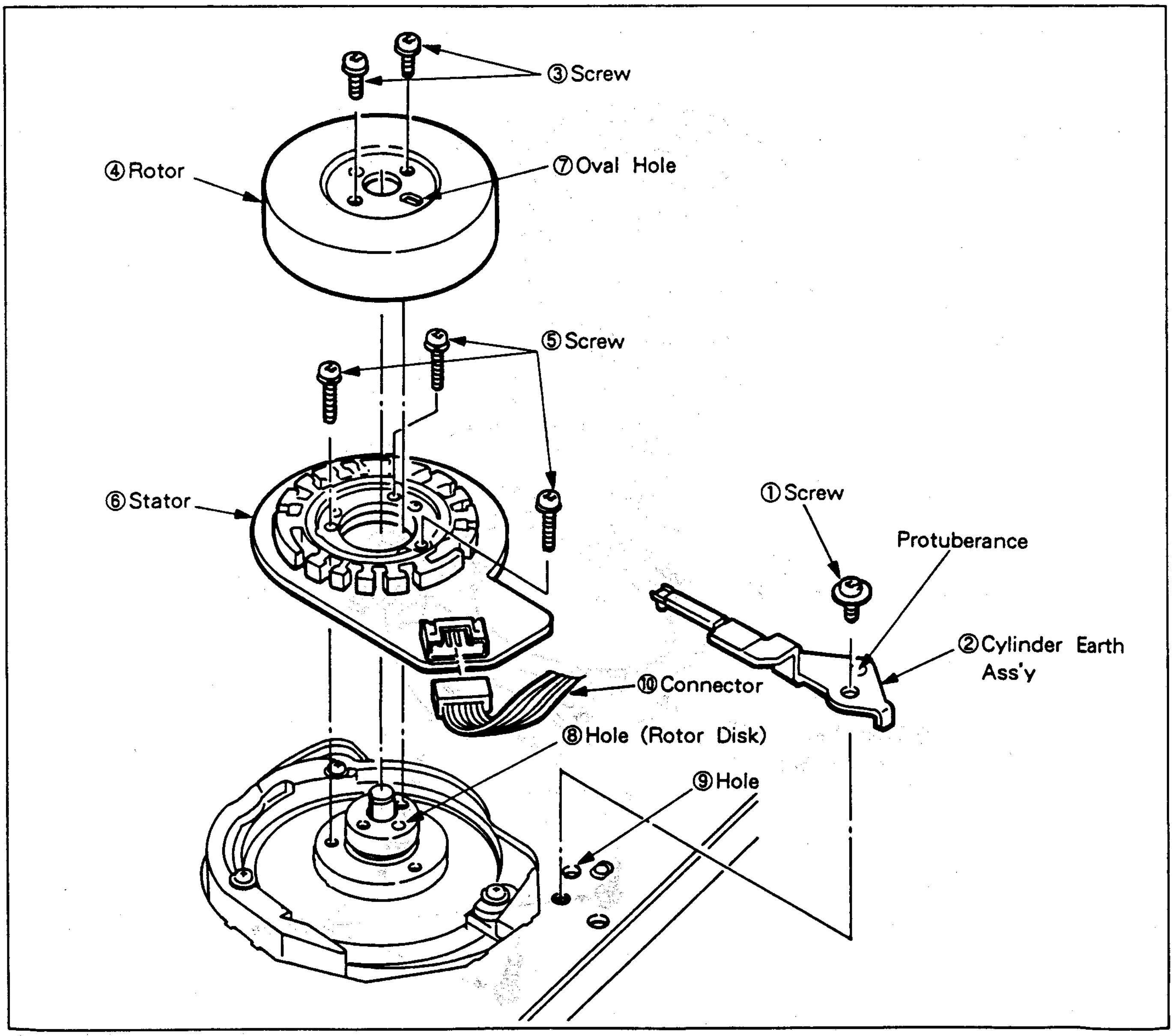

③Screw
④Rotor
⑦Oval Hole
⑤Screw
⑥Stator
①Screw
Protuberance
②Cylinder Earth Ass'y
⑩Connector
⑧Hole (Rotor Disk)
⑨Hole

Fig. 5-11-1. Drum Motor

5-11-2. Drum Unit (See Fig. 5-11-2.)

1. Removal

1) For some models with the board located above the upper drum, remove the board.
2) Remove the flexible P.C.B. ① from the COMPL VP-1 (take care not to pull the flexible P.C.B. in the upward direction).
3) Remove the LOAD RACK only, as instructed in 5-4-1.
4) Remove the three screws ②, then remove the drum unit ③.

Note 1 : A spacer ⑥ is sometimes inserted between the LOWER DRUM (LOWER CYLINDER) ④ and the DRUM BASE (CYLINDER BASE) ⑤. In this case, put it back in its original position when remounting the drum.

Note 2 : When removing and remounting the drum unit, handle it carefully to protect it from scratches and dirt.

2. Remounting

1) While aligning the drum unit ③ to the protuberance, mount it to the drum base (CYLINDER BASE) ⑤ with the three screws ②.
2) Mount the ROAD RACK as instructed in 5-4-1.
3) Insert the flexible P.C.B. into the COMPL VP-1.
4) Clean the drum unit.
5) Perform the tape path adjustment as instructed in 6-4. and perform the CH-1/CH-2 switching position adjustment of the servo circuit.

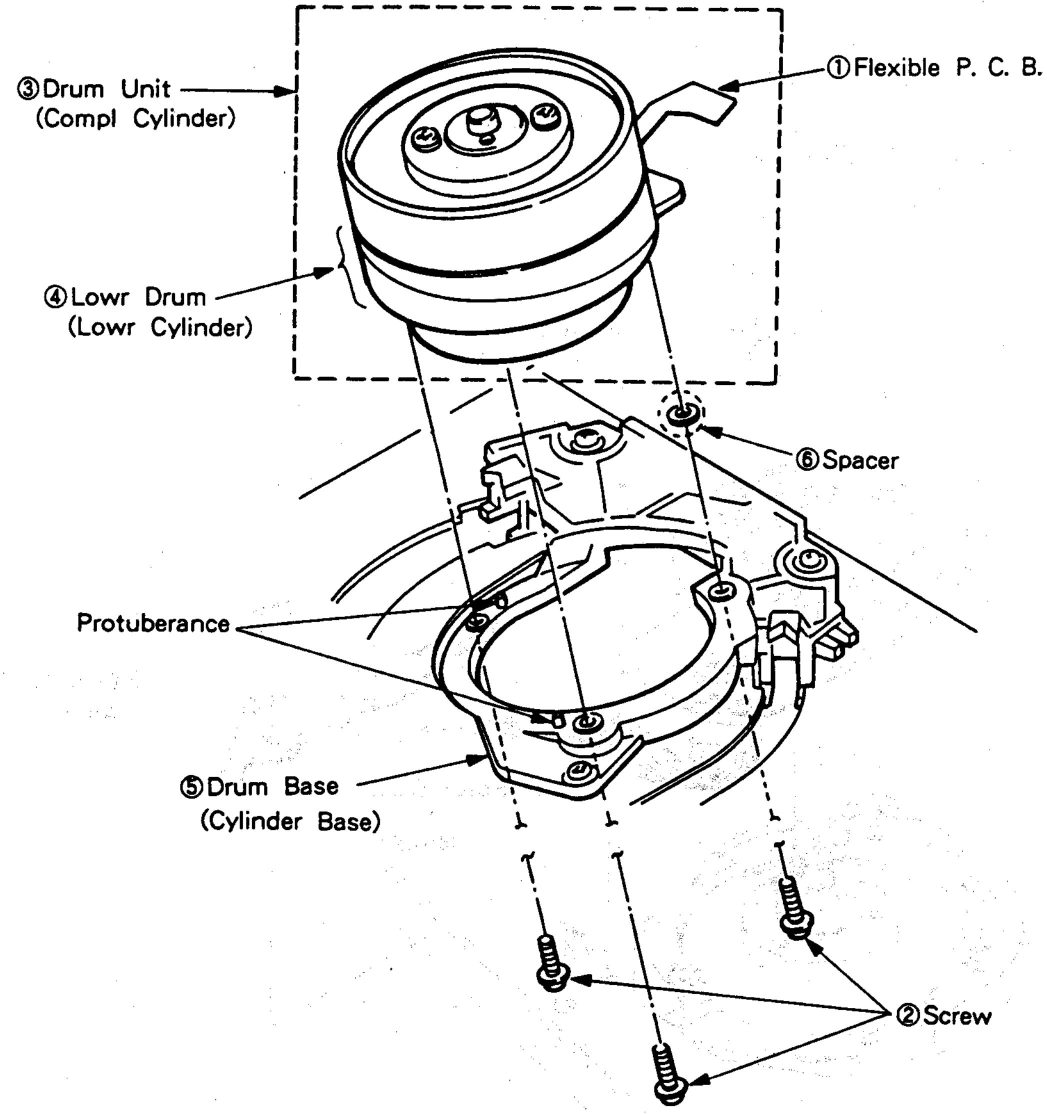

③Drum Unit
(Compl Cylinder)
①Flexible P. C. B.
④Lowr Drum
(Lowr Cylinder)
⑥Spacer
Protuberance
⑤Drum Base
(Cylinder Base)
②Screw

Fig. 5-11-2 Drum Unit (Compl Cylinder)

5-11-3. Upper Drum (Upper Cylinder)

1. Removal

1) Remove the two screws ① (see Fig. 5-11-3).
2) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum (UPPER CYLINDER), remove the lead wires soldered from the P.C. board (see Fig. 5-11-4.).
3) Turn the head removing jig (VHJ-0041) handle ② counterclockwise to lift up the stopper ③ (see Fig. 5-11-5.).
4) Insert the two long screws ④ of the jig into the screw holes ⑥ located on the head chip side of the upper drum (UPPER CYLINDER) ⑤, then mount by turning the handle clockwise.
5) While holding the jig so that the upper drum ⑤ does not rotate, turn the handle ② clockwise to remove the upper drum.
6) Remove the jig from the upper drum.

Note : Handle parts carefully to protect the drum from scratches and dirt, and the video head from damage.

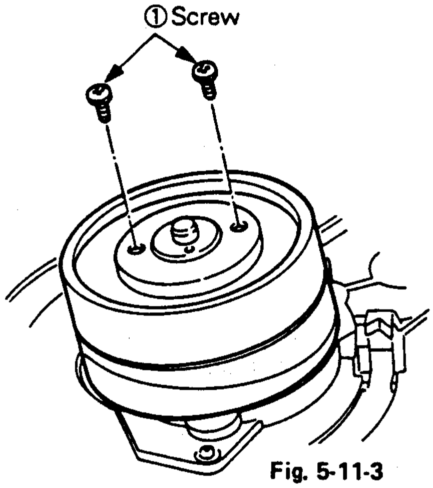


Fig. 5-11-3

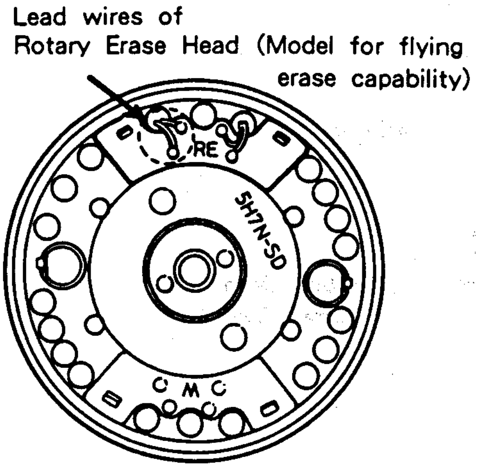

Lead wires of
Rotary Erase Head (Model for flying erase capability)
RE
5H7N-SD
C M C

Fig. 5-11-4

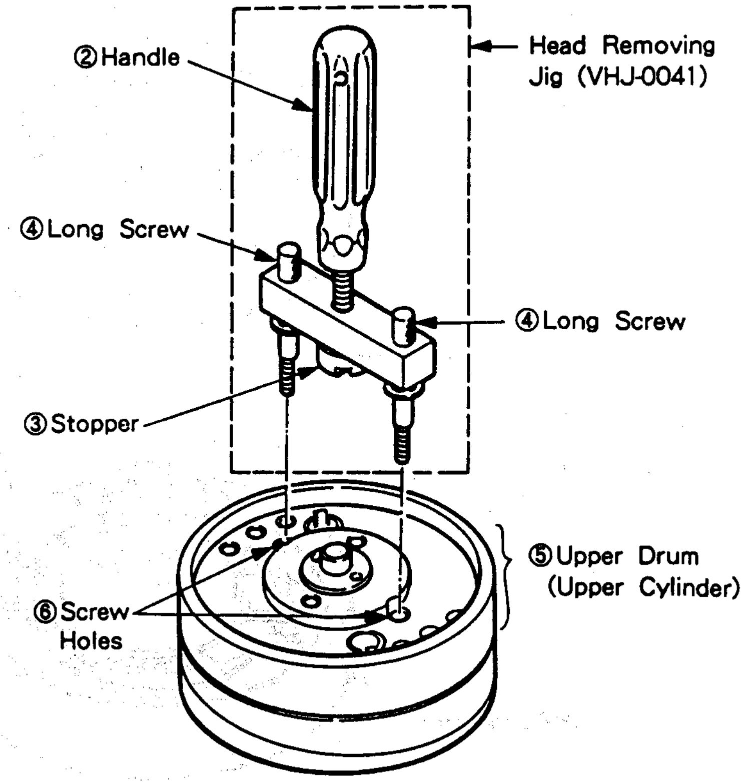

②Handle
Head Removing Jig (VHJ-0041)
④Long Screw
④Long Screw
③Stopper
⑤Upper Drum (Upper Cylinder)
⑥Screw Holes

Fig. 5-11-5

Upper Drum (Upper Cylinder)

2. Remounting (See Fig. 5-11-6.)

1) Confirm that surfaces where the flywheel and the upper drum (UPPER CYLINDER) are engaged or make contact portion are free from scratches and dirt.
2) The code name ① of the drum is printed on the video head side of the upper drum ⑤ SP CH-1 (channel A, plus azimuth). The code name ① is set with in the rotary transformer terminal round hole side ② position of lower drum (LOWER CYLINDER), so that the two screw holes ③ of the upper drum are aligned with the two screw holes ④ of the flywheel. (Refer to 3. Recognizing the SP CH-1 Head side).
3) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum, pass the lead wires through the lead wire hole. (See Fig.5-11-4.)
4) While keeping the upper drum ⑤ parallel to the lower drum (LOWER CYLINDER) ⑧, insert it completely into the flywheel.
5) Temporarily tighten the two screws ⑦ alternately a little at a time, then tighten them to a torque of 6kg-cm using a torque driver (VHJ-0014) and a 3mm bit (VHJ-0045).
6) In case the RE head is attached to the upper drum ⑤, solder the lead wires to the P.C. board. Solder the red lead wire to the R terminal, and the yellow lead wire to the Y terminal.

Note : When the upper drum has been replaced, perform a tape path adjustment as instructed in 6-4. and CH-1/CH-2 switching position adjustment of the servo circuit.

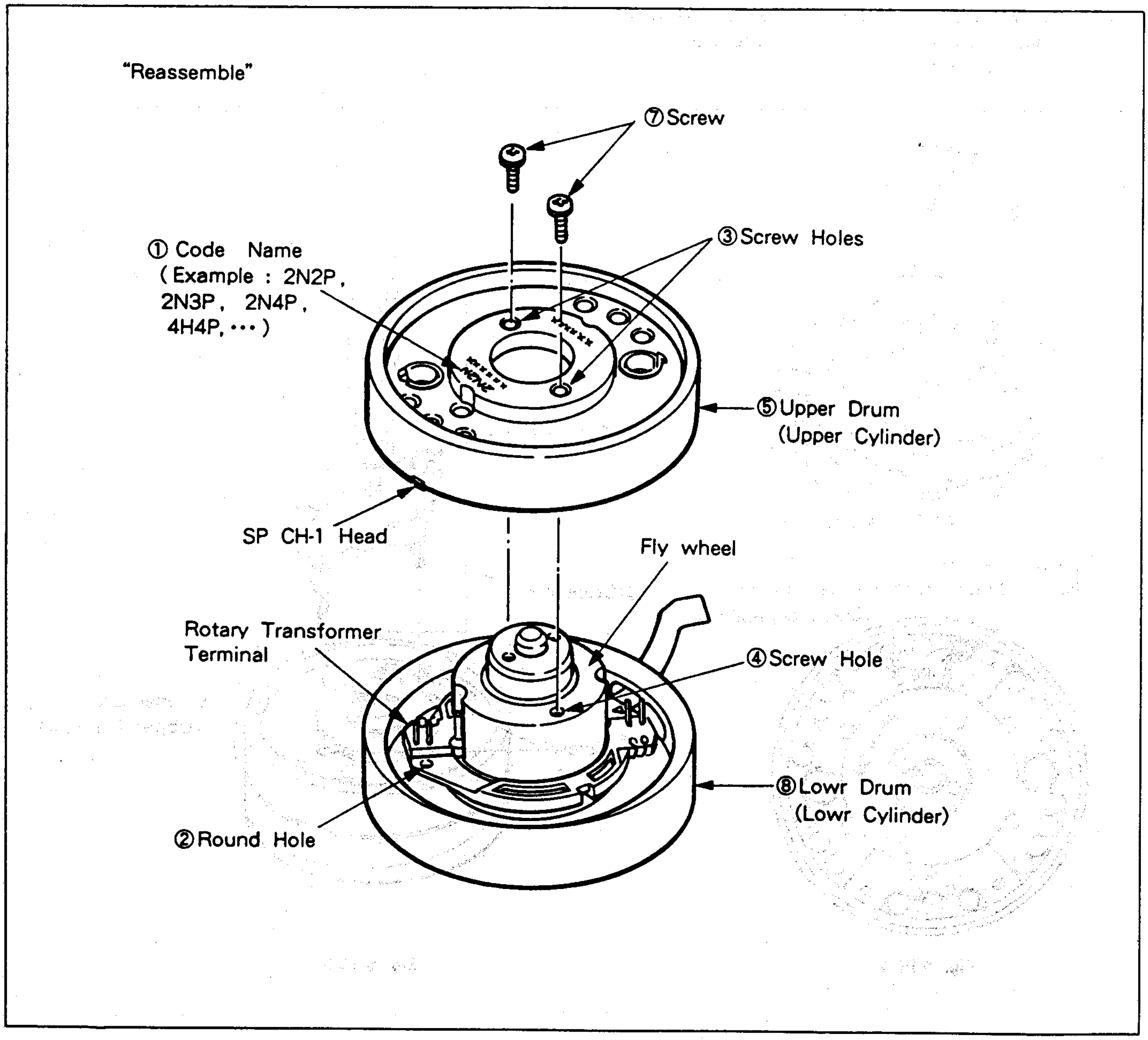
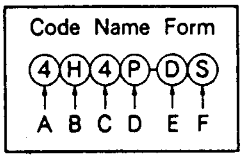

"Reassemble"
⑦Screw
③Screw Holes
① Code Name (Example : 2N2P, 2N3P, 2N4P, 4H4P, ···)
⑤Upper Drum (Upper Cylinder)
SP CH-1 Head
Fly wheel
Rotary Transformer Terminal
④Screw Hole
⑧Lowr Drum (Lowr Cylinder)
②Round Hole

Fig. 5-11-6

3. **Recognizing the SP CH-1 Head Side**
No playback picture can be obtained if the video head is not wired as a pair with the rotary transformer located inside the lower drum rotating section. Therefore, mounting position should be matched when mounting the upper drum. In the P88 mechanism series, the code name of the drum is printed on the SP CH-1 (CH-A, plus azimuth) side as a mark for mounting the upper drum. (See Fig. 5-11-7.) This code name differs according to the drum type, but its basic form is as follows :

A = Number of head bases
B = "N" for normal audio
"H" for HI-FI audio
C = Number of heads
D = TV system ("N" or "P")
EF = Code for detailed classification. Depending on drum type, it can also be just one character, or a blank space.


Code Name Form
4
H
4
P
D
S
A
B
C
D
E
F

Examples of Detailed Classification Codes
V = Head with level difference
D = Compatible with digital units
S = SVHS-compatible

Examples of Code Names
2N2P, 2N2P-L, 2N2P-V, 2N2P-D, 2N3P, 2N4P, 4H4P, 4H4P-D

Moreover, there is a round hole with marking purposes on the SP CH-1 (CH-A, plus azimuth) side of the lower drum rotary transformer terminal. As shown in Fig. 5-11-8, there are two types of rotary transformer terminals (the number of pins differs according to the number of heads).

Note : When ordering parts such as drums (CYLINDERS), do not use the code names ; always refer to the parts list and order with the specified part numbers.

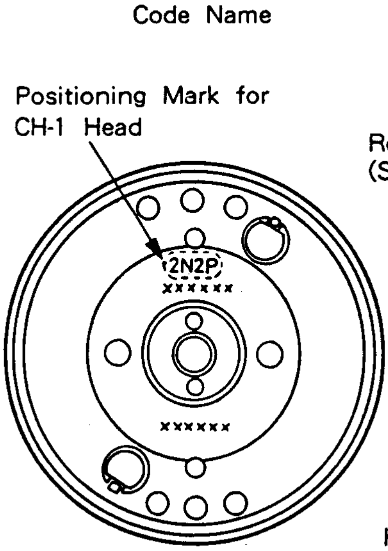

Code Name
Positioning Mark for CH-1 Head
2N2P
xxxxxx
xxxxxx

Fig. 5-11-7. Upper Drum

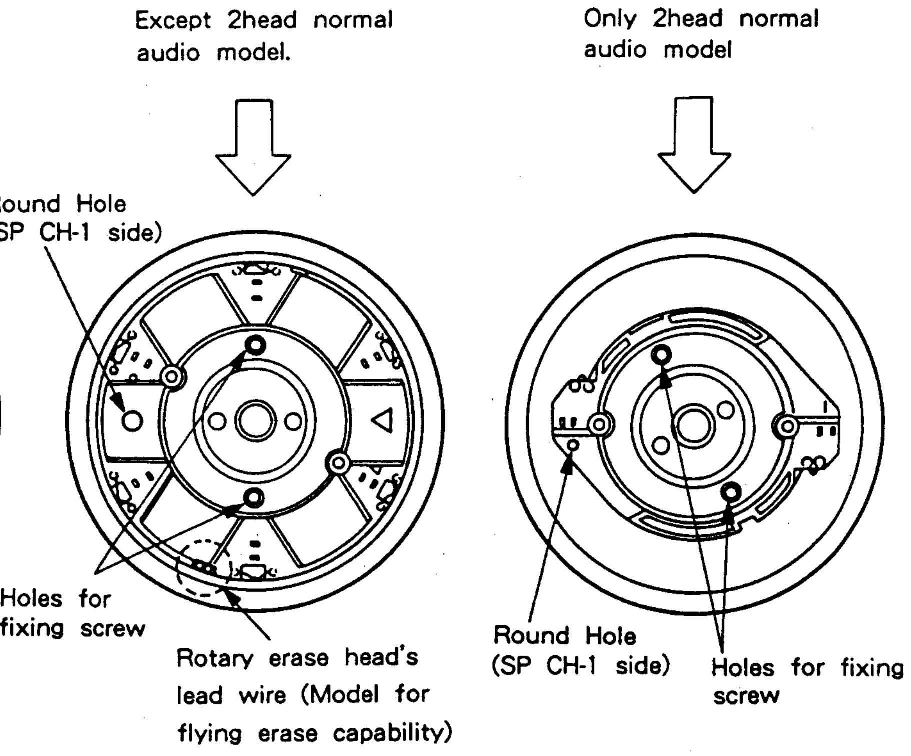
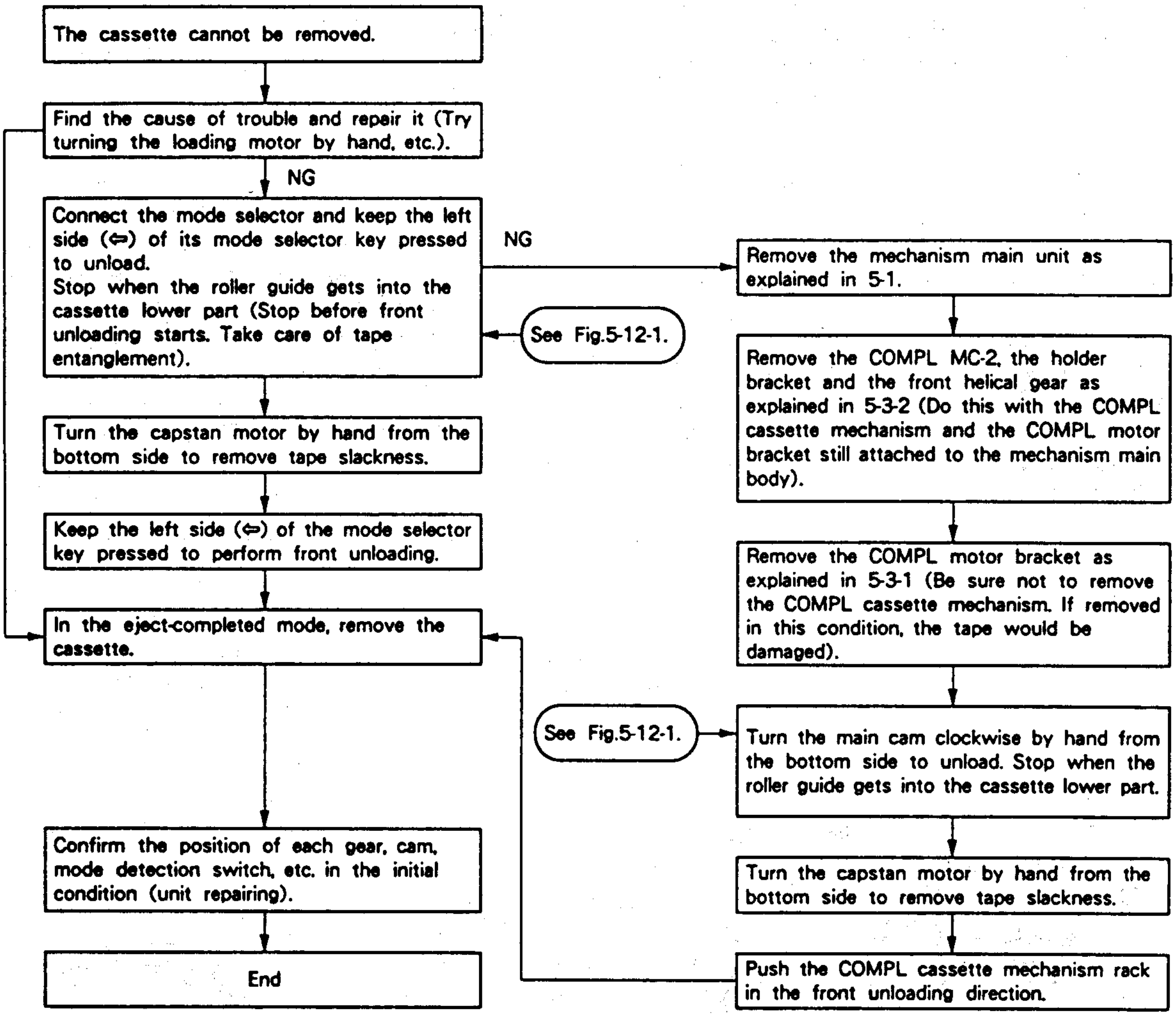

Except 2head normal audio model.
Only 2head normal audio model
Round Hole (SP CH-1 side)
Holes for fixing screw
Rotary erase head's lead wire (Model for flying erase capability)
Round Hole (SP CH-1 side)
Holes for fixing screw

Fig. 5-11-8. Lower Drum

5-12. HOW TO PROCEED WHEN THE CASSETTE CANNOT BE REMOVED



The cassette cannot be removed.

Find the cause of trouble and repair it (Try turning the loading motor by hand, etc.).

NG

Connect the mode selector and keep the left side (⇦) of its mode selector key pressed to unload.
Stop when the roller guide gets into the cassette lower part (Stop before front unloading starts. Take care of tape entanglement).

See Fig.5-12-1.

Turn the capstan motor by hand from the bottom side to remove tape slackness.

Keep the left side (⇦) of the mode selector key pressed to perform front unloading.

In the eject-completed mode, remove the cassette.

Confirm the position of each gear, cam, mode detection switch, etc. in the initial condition (unit repairing).

End

NG

Remove the mechanism main unit as explained in 5-1.

Remove the COMPL MC-2, the holder bracket and the front helical gear as explained in 5-3-2 (Do this with the COMPL cassette mechanism and the COMPL motor bracket still attached to the mechanism main body).

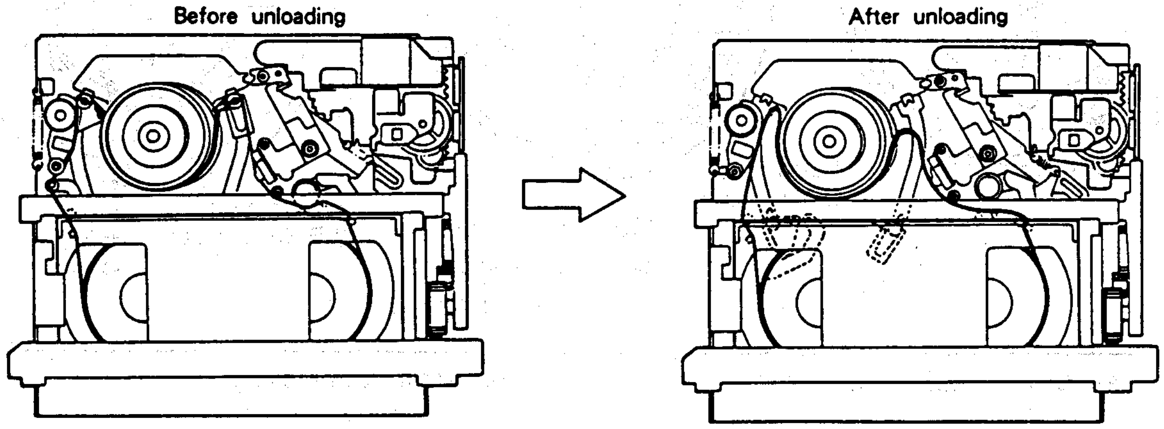
Remove the COMPL motor bracket as explained in 5-3-1 (Be sure not to remove the COMPL cassette mechanism. If removed in this condition, the tape would be damaged).

See Fig.5-12-1.

Turn the main cam clockwise by hand from the bottom side to unload. Stop when the roller guide gets into the cassette lower part.

Turn the capstan motor by hand from the bottom side to remove tape slackness.

Push the COMPL cassette mechanism rack in the front unloading direction.



Perform unloading using the mode selector.

First rotate the capstan motor by hand from the bottom to take-up the tape slack, and perform front-unloading using the mode selector.

Fig. 5-12-1

6. MECHANISM ADJUSTMENT

6-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED (See Fig. 6-1-1.)

1) Attach black vinyl tape to the T. END and T. TOP sensors to prevent light from entering.
2) Push the TRAY LOCK LEVER in the direction of the arrow to maintain the unlocked condition. Release the lever just before the TRAY starts moving down.
3) In this condition, operation is possible in every mode. However, the following procedures are necessary to operate the unit in the REC, REW and R-SEARCH modes.

REC mode :	Push the SAFETY SW LEVER to turn the SAFETY SWITCH (Erasure Prevention Switch) ON, then press the REC button. If the SAFETY SWITCH is not turned ON, the unit will enter the EJECT mode.
REW/R-SEARCH :	After pressing the REW button, turn the TAKE-UP REEL ASS'Y by hand. Otherwise, the reel sensor will operate, setting the INITIAL mode after 2 to 3 seconds.

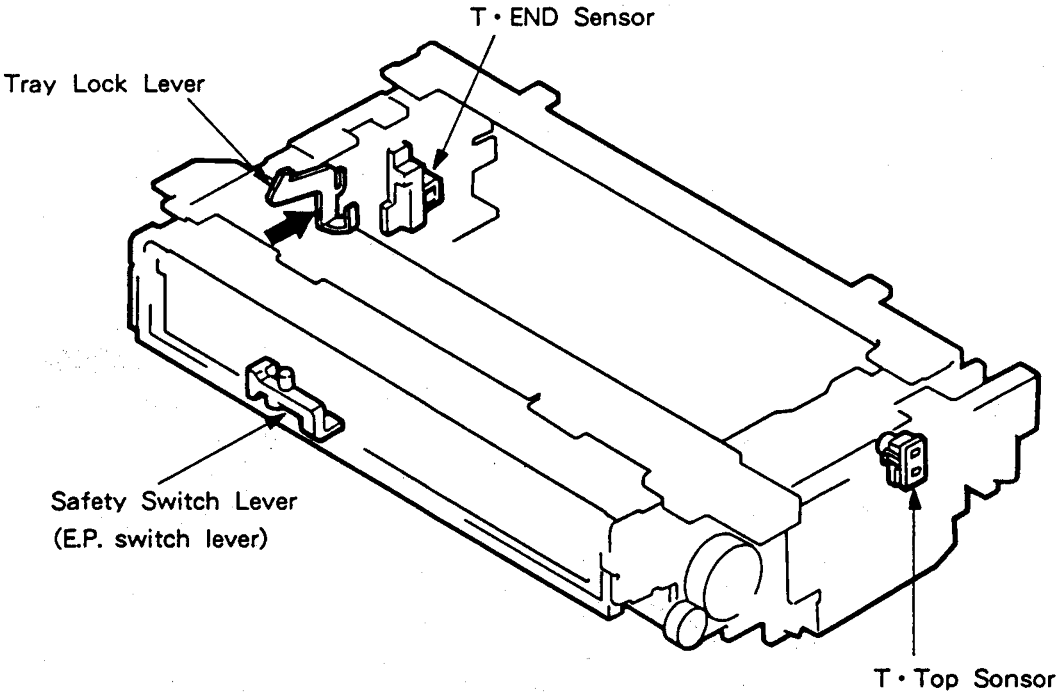


Fig. 6-1-1. Preparations for Adjustment

6-2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK

6-2-1. Reel Table Height (See Fig. 6-2-1.)

If the SUPPLY REEL ASS'Y or the TAKE-UP REEL ASS'Y is raplaced, it will be necessary to adjust the REEL TABLE height.

(1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1 of Service Manual.
(2) Attach the master plane (H-7099-279-H) and reel disc height jig (H-7099-038-H) in the direction of the arrows.
(3) Confirm that, when the gauge stops, the REEL TABLEs are not in contact with surface A of the plate and side of the REEL TABLEs are in contact with surface B.
(4) If the REEL TABLE is in contact with surface A, remove a spacer and check again.
(5) If the REEL TABLE is not in contact with surface B, add a spacer and check again.
(6) Remove the master plane.
(7) Set the EJECT mode with the mode selector.
(8) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1 of Service Manual.

Note:

- Adjust the reel table height by adding or removing spacers(0.13t, 0.25t, 0.3t, 0.4t and 0.5t)as appropriate so that the height meets the specifications. Use the same method for both the TAKE-UP REEL TABLE and the SUPPLY REEL TABLE.
  (The 0.5t washer is included as the standard washer for the SUPPLY REEL ASS'Y. The 0.4t washer is included as the standard washer for the TAKE-UP REEL ASS'Y.)
- If the height of the reel table is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

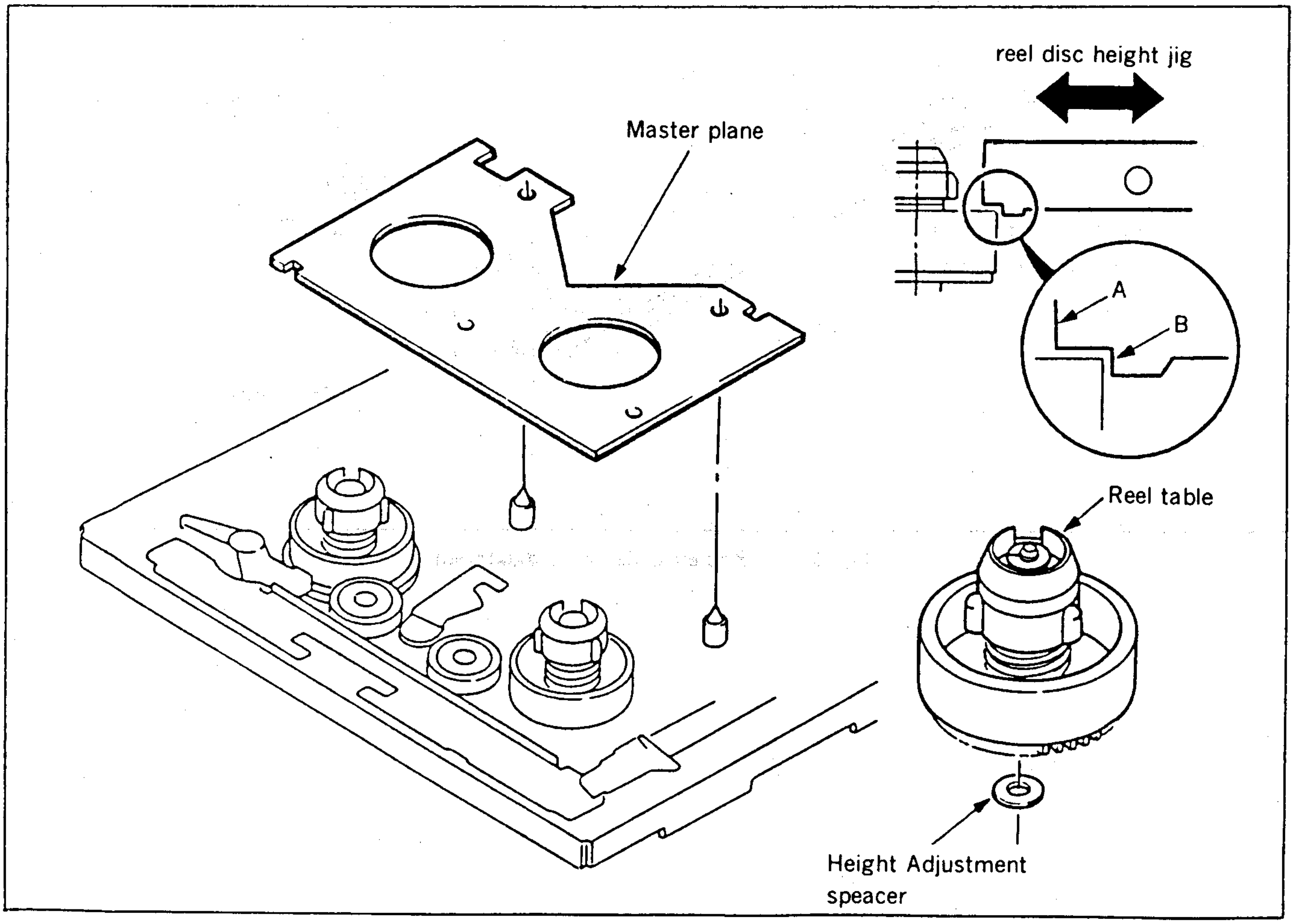


Fig. 6-2-1. Reel Table Height Adjustment

6-2-2. Torque Check (See Fig. 6-2-2.)

1) Set the unit to operating condition without a cassette inserted as instructed in 6-1.
2) Measure the SUPPLY REEL TABLE torque in the REW mode, and confirm that it is 600gcm or more. Perform this measurement keeping the torque gauge in a fixed position with your hand (locked torque).
3) Measure the TAKE-UP REEL TABLE torque in the F.FWD mode, and confirm that it is 600gcm or more (locked torque).
4) Measure the TAKE-UP REEL TABLE torque in the playback mode (SP tape speed), and confirm that it is within 80 through 150gcm (locked torque).
5) After confirming that torque readings are within the specifications for each mode, check the following :
   - ⓐ Dirt on the capstan motor and the REEL PULLEY groove.
   - ⓑ Deterioration of the REEL DRIVE BELT.
   - ⓒ Deterioration of the FRICTION GEAR ASS'Y felt (torque during playback).
   - ⓓ Wear and damage of the COMPL CLUTCH MECHANISM and the reel drive system gears.

Note : Items ⓑ, ⓒ and ⓓ require replacement if found defective.

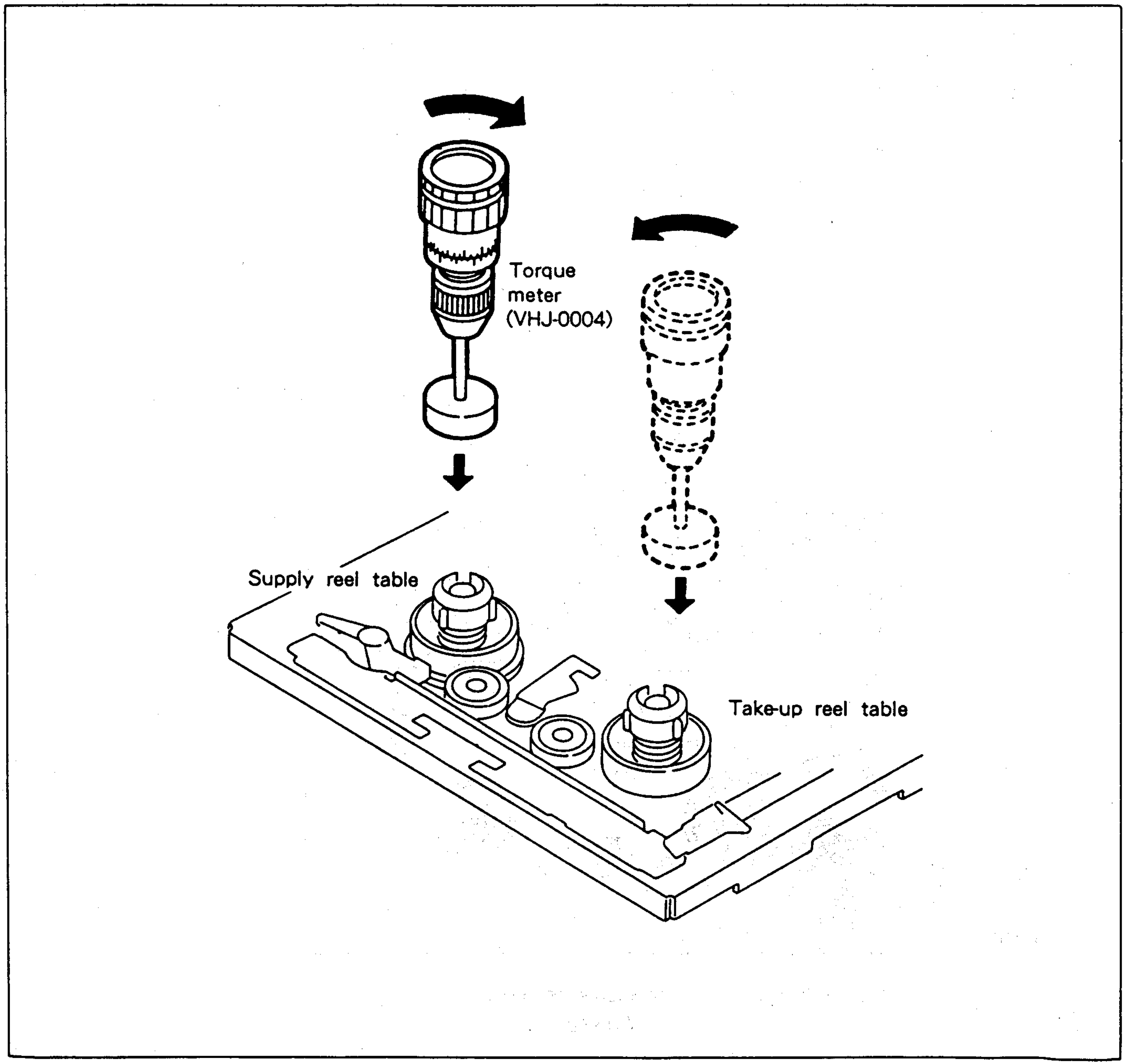


Fig. 6-2-2 Checking REW/FF/PLAY Torque

6-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK

6-3-1. Tension Pole (Back Tension Guide) Position Adjustment (See Fig. 6-3-1.)

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1 of Service Manual.
2) Set the PLAY mode with the mode selector (VHJ-0050)
3) Confirm that the space between the end of chassis and the Tension arm is from 4mm to 6mm.
4) In case the tension pole is not withim 4-6mm, adjust it by loosening the screw ④ a little and changing the mounting position of the BAND HOLDER ⑤ in the direction of the arrow Ⓐ.
5) Set the EJECT mode with the mode selector.
6) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1 of Service Manual.
7) Confirm that back tension torque is within 42± 5gcm, as instructed in 6-3-2 below.

6-3-2. Back Tension Torgue Chack (See Fig. 6-3-1.)

1) Attach the cassette torquemeter (VHJ-0016) and set the PLAY mode.
2) Confirm that back tension torque is within 42± 5gcm.
3) In case back tension torque dose not meet the above specification, proceed as follows:

ⓐ Clean the portion where the brake band (BAND HOLDER ASS'Y) ⑦ of the SUPPLY REEL ASS'Y ⑥ makes contact.

ⓑ Confirm that the brake band of the BAND HOLDER ASS'Y ⑦ does not make wear and that it is clean. If wear or dirt is found, replace the band holder assembly ⑦ as instructed in 5-7-3 of Service Manual.

ⓒ Raplace the TENSION LEVER ASS'Y SPRING COIL ⑧.

Note : Always follow procedures in 6-3-1. Tension Pole Position Adjustment after performing ⓐ, ⓑ and ⓒ.

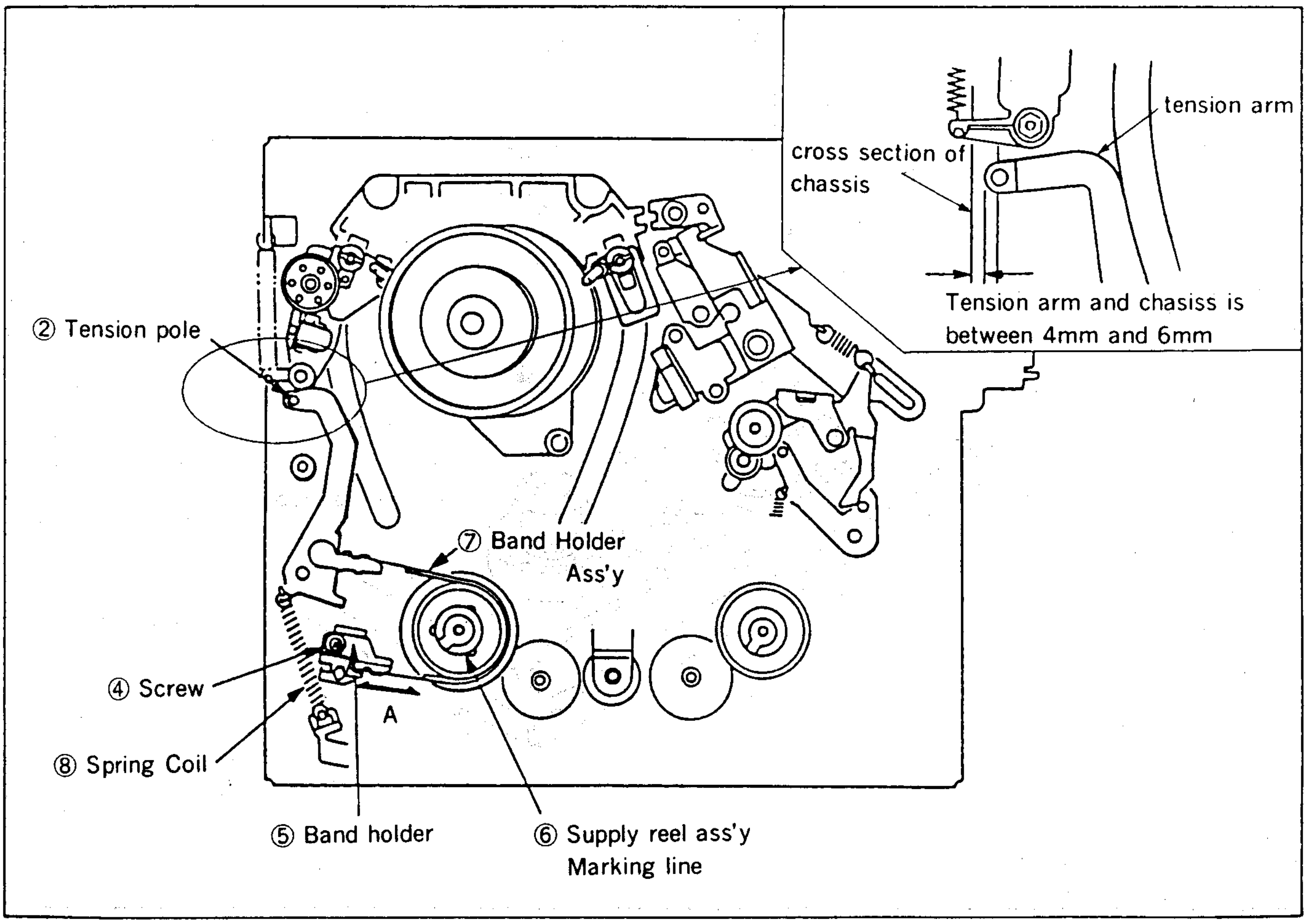

tension arm
cross section of chassis
Tension arm and chasiss is between 4mm and 6mm
② Tension pole
⑦ Band Holder Ass'y
④ Screw
⑧ Spring Coil
A
⑤ Band holder
⑥ Supply reel ass'y
Marking line

Fig. 6-3-1. Tension Pole Positioning Adjustment

6-4. TAPE PATH ADJUSTMENT

The tape path mechanism is precisely adjusted at the factory. Normally no readjustment is required, but checking and/or adjustment is necessary when parts of the tape path mechanism among those shown in the figure below (See Fig. 6-4-1.) have been removed or replaced after a long period of use.

This operation consists of adjusting the various guides so that the tape drawn out from the supply reel runs smoothly along the DRUM (CYLINDER) lead surface. A way of grasping the tape path condition by electronic means is monitoring the video head output envelope waveform with an oscilloscope. However, the fact that visual observation is essential in order to know whether the tape is running through the various guides in a smooth and natural way should be kept in mind when checking and adjusting.

Also remember that the position of tape guides is not greatly affected by the replacement of the UPPER DRUM (UPPER CYLINDER) or the COMPL DRUM (COMPL CYLINDER), provided that it is correctly performed, and that only the replaced parts should be adjusted after replacing a tape guide or COMPL HEAD BRACKET, since the position of the other tape guides shall not change considerably.

6-4-1. Preparations for Adjustment

(1) Clean the tape transport surfaces (See Fig. 6-4-1.).

(2) Connect the oscilloscope. Connect the channel 1 probe to the envelope waveform test point, and the channel 2 probe to the RF SW P test point. During adjustment, apply a trigger to the L side of the RF SW P in order to monitor the waveform output from channel 1 of the video head.

Note : Since oscilloscope connection points differ according to the model, refer to the "Test Point for Tape Path Adjustment" allocation figure in the electric circuit adjustment section of the service manual book.

(3) Use a dentist's mirror for visual observation of tape path condition.

(4) Use a nut box (VHJ-0048) for adjustment of the fixed guides.

(5) Use an eccentric driver (VHJ - 0003) for adjustment of the guide rollers.

(6) When adjusting height of the fixed guides, guide rollers or COMPL head bracket, turn the special nut or the upper flange clockwise to push the tape downward, and counterclockwise to make the tape rise up.

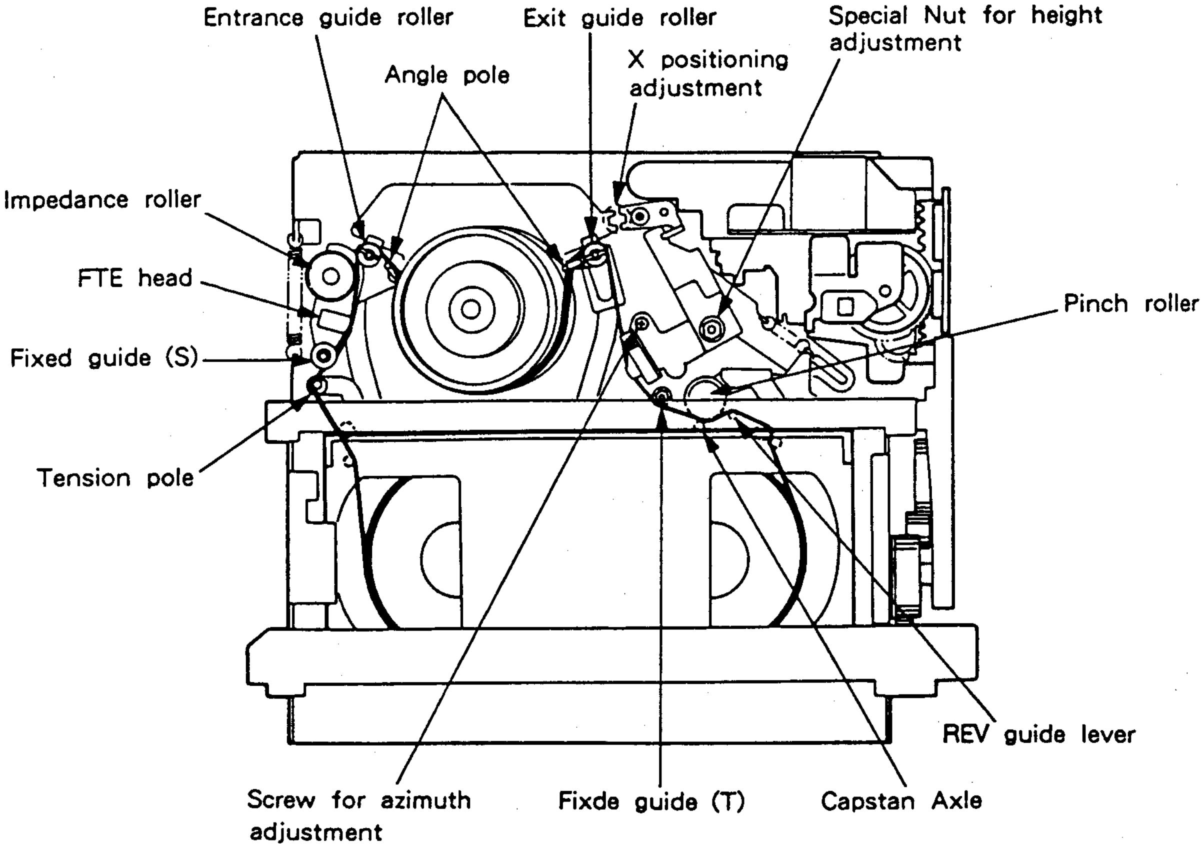

Entrance guide roller
Exit guide roller
Special Nut for height adjustment
Angle pole
X positioning adjustment
Impedance roller
FTE head
Fixed guide (S)
Tension pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Fixde guide (T)
Capstan Axle

Fig. 6-4-1 Preparation for Adjustment

6-4-2. Adjustment by Visual Observation after Guide Roller, Fixed Guide or COMPL Head Bracket Replacement

Perform this adjustment after removing or replacing any of the above parts. Only for the replaced or removed parts, play back an alignment tape (VHJ-0009) beforehand and adjust height by visual observation.

(1) Fixed Guides (See Fig. 6-4-2.)
Adjust so that the tape upper edge does not make contact with the fixed guide upper flange, and the tape lower edge does not make contact with the fixed guide lower flange. Gaps A and B should remain equal.

(2) Guide Rollers (See Fig. 6-4-3.)
The tape should not be curled by the guide roller upper and lower flanges. It should also run smoothly, without moving up and down on the DRUM (CYLINDER) lead surface.

Note : An excessive guide roller pressure may cause tape damage.

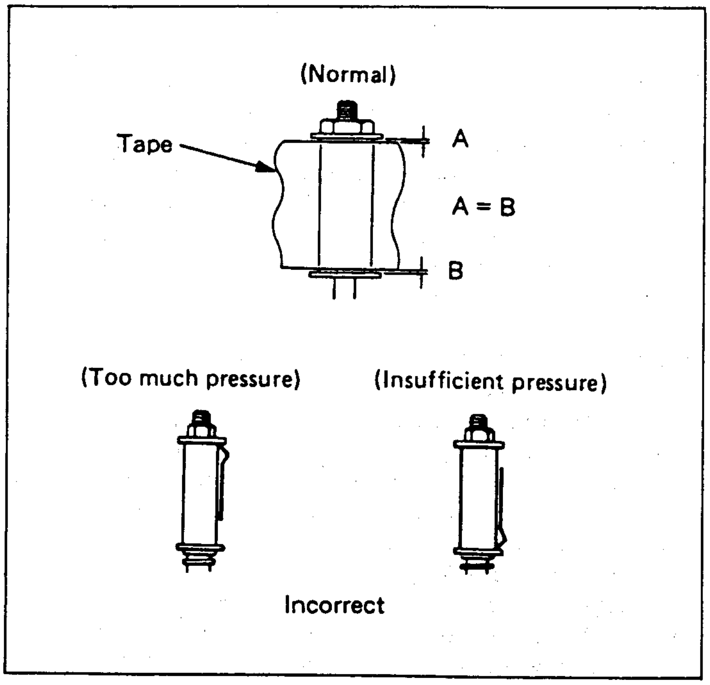

(Normal)
Tape
A
A = B
B
(Too much pressure)
(Insufficient pressure)
Incorrect

Fig. 6-4-2 (1) Pre-set for Fixed Guide

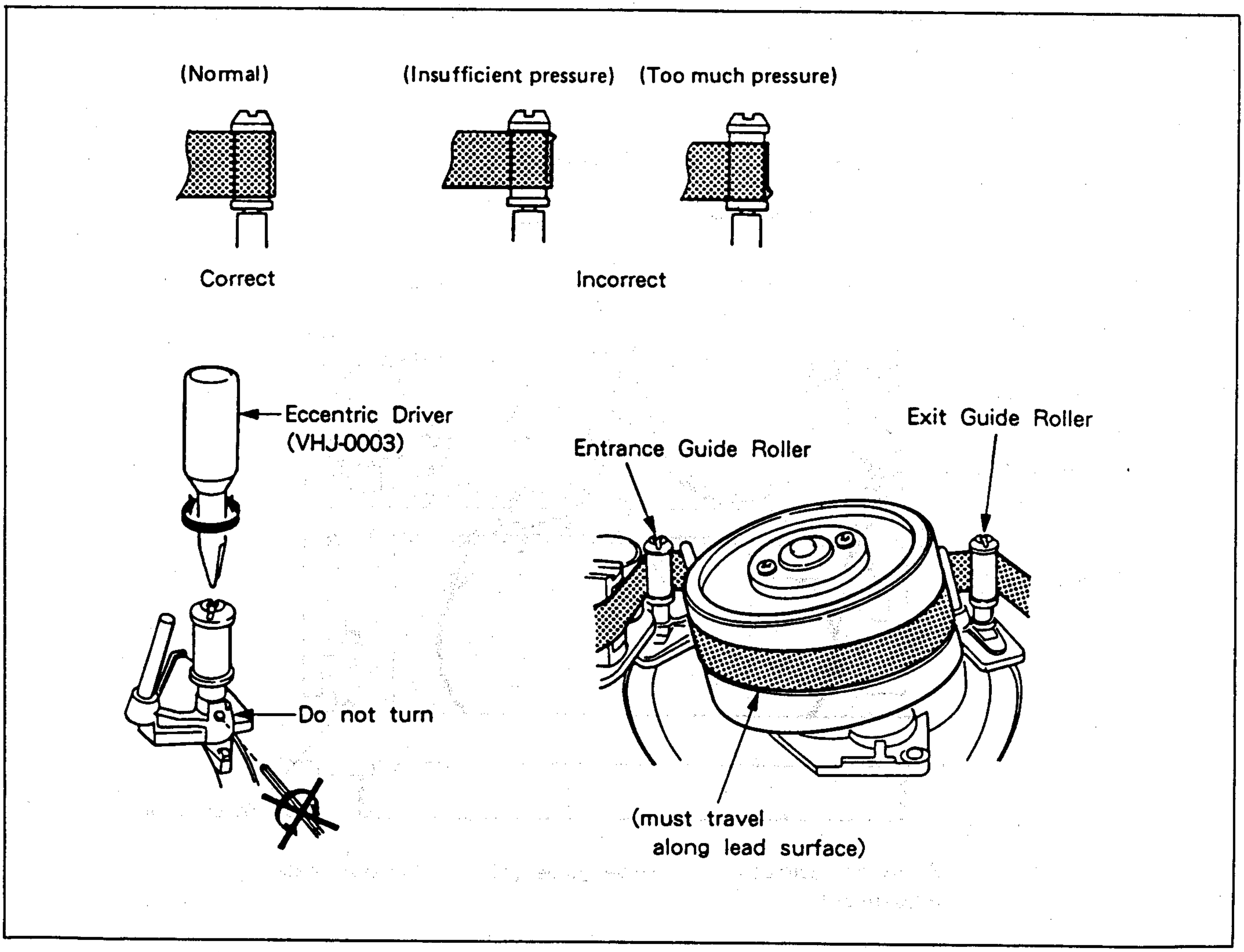

(Normal)
(Insufficient pressure)
(Too much pressure)
Correct
Incorrect
Eccentric Driver
(VHJ-0003)
Do not turn
Entrance Guide Roller
Exit Guide Roller
(must travel
along lead surface)

Fig. 6-4-3 (2) Pre-set for Guide Roller

(3) COMPL Head Bracket (ACE Head) (See Fig. 6-4-4.)
Adjust the special nut so that the tape edge runs between the audio head upper end and the control head lower end. Gaps A and B should be of about the same width. Since at this point it is only required that the control signal is picked up and the servo circuit works normally, no adjusting screws except the COMPL head bracket special nut should be touched.

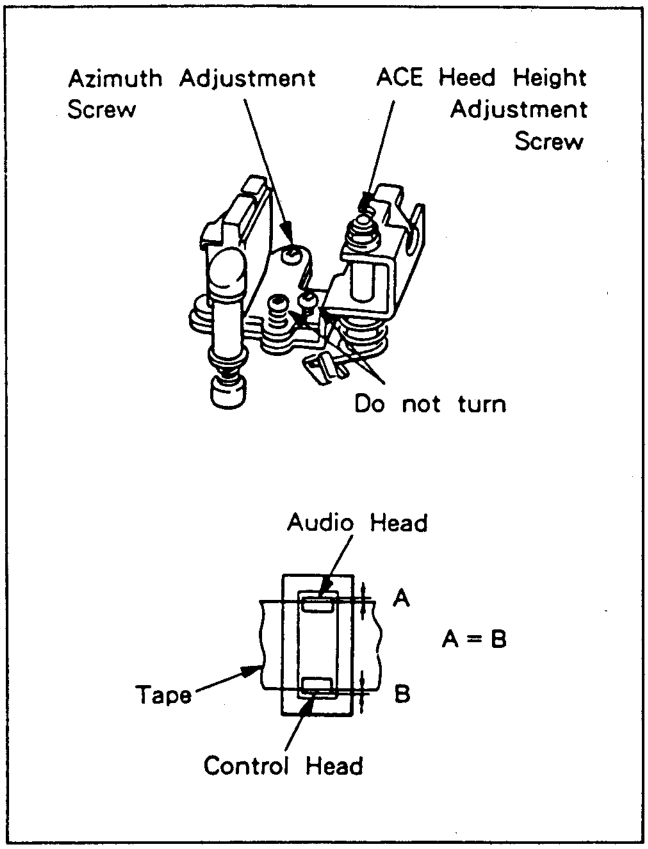

Azimuth Adjustment Screw
ACE Heed Height Adjustment Screw
Do not turn
Audio Head
A
A = B
Tape
B
Control Head

Fig. 6-4-4 (3) Pre-set for Compl Head Bracket

6-4-3. Entrance Side Fixed Guide (S) Height Adjustment (See Fig. 6-4-5.)

1) Rotate the fixed guide (S) counterclockwise to lift the tape somewhat, then insert the fixed guide height gauge (VHJ-0053) into the lower side of the fixed guide (S) lower flange.
2) Rotate the fixed guide (S) special nut clockwise a little at a time until the lower flange makes contact with the upper surface of the fixed guide height gauge, causing a slight drag.
3) After rotating the special nut 90° counterclockwise, remove the fixed guide height gauge.
4) After adjusting the guide rollers in section 6-4-2, play back the alignment tape (VHJ-0009). Confirm that the tape lower edge runs in close contact with the fixed guide (S) lower flange. In case too much pressure has left a gap between the tape and the lower flange, or excessive lifting has caused curling of the tape lower edge, perform fine adjustment. However, do not adjust the special nut beyond 90° clockwise and 45° counterclockwise.

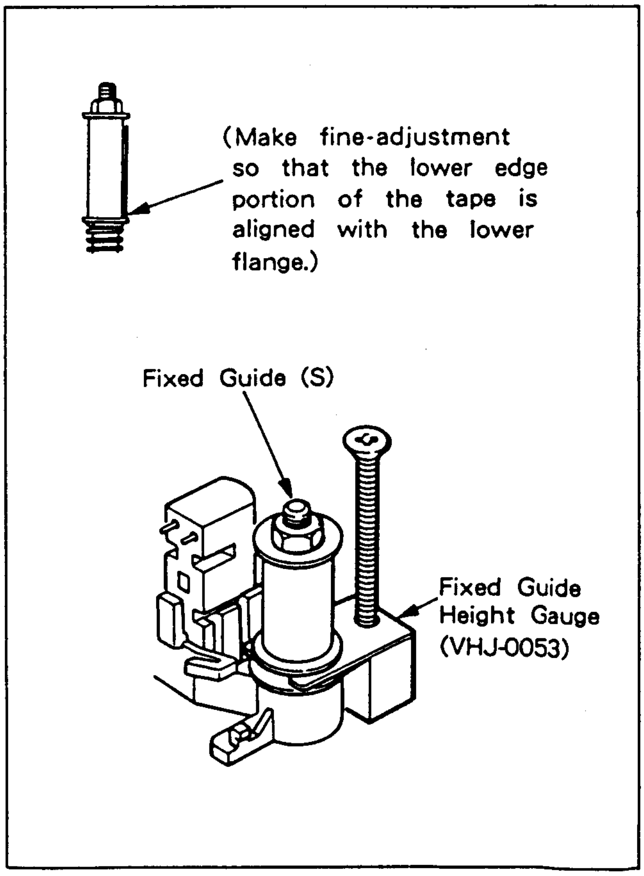

(Make fine-adjustment so that the lower edge portion of the tape is aligned with the lower flange.)
Fixed Guide (S)
Fixed Guide Height Gauge (VHJ-0053)

Fig. 6-4-5

6-4-4. Guide Roller Adjustment (See Fig. 6-4-6.)

1) Play back the alignment tape (VHJ-0009), press the tracking control key and adjust the envelope waveform to the maximum level.
2) Loosen the entrance and exit guide rollers by rotating them counterclockwise, then rotate them clockwise alternately until they are fastened and a flat video output waveform is obtained.
3) Confirm that the envelope waveform is not deformed, and check visually that no curling occurs at the guide roller upper and lower flanges.
4) Press the tracking control key and set the envelope waveform level to approx. 50% of the maximum. In this condition, confirm whether the envelope waveform is flat. It will not, showing valleys or peaks at the first half (entrance) or second half (exit), if the guide roller pressure is excessive or insufficient.

   In case there is unevenness in the first half (entrance), adjust the entrance side guide roller. If the second half (exit) shows trouble, adjust finely the exit side guide roller.

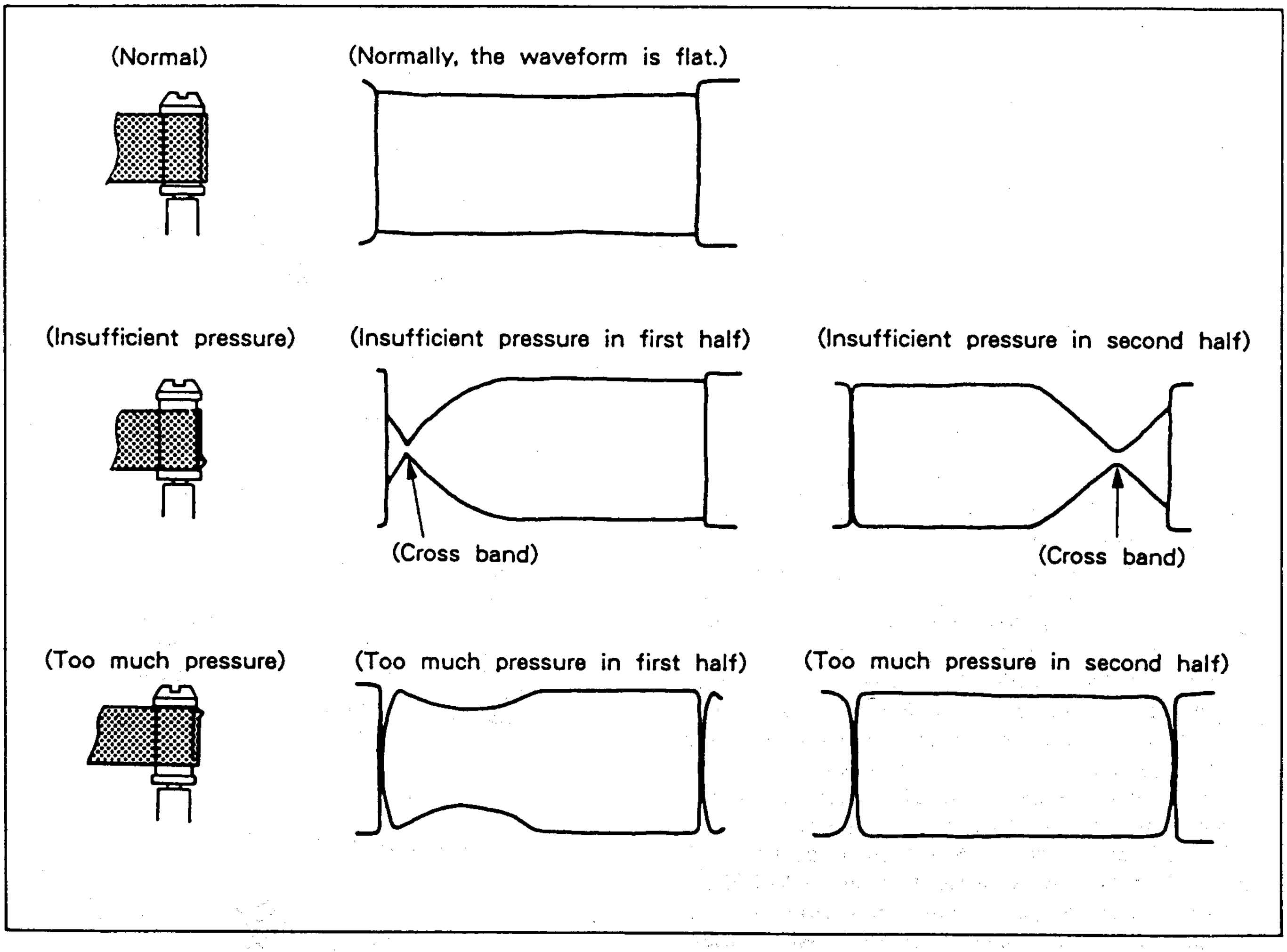

(Normal)
(Normally, the waveform is flat.)
(Insufficient pressure)
(Insufficient pressure in first half)
(Insufficient pressure in second half)
(Cross band)
(Cross band)
(Too much pressure)
(Too much pressure in first half)
(Too much pressure in second half)

Fig. 6-4-6 Guide Roller Adjustment

6-4-5. Exit Side Fixed Guide (T) Adjustment (See Fig. 6-4-7.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
2) Rotate the special nut counterclockwise so that the lower flange lifts the tape until its lower edge is slightly curled.
3) Rotate the special nut clockwise a little at a time until curling of the tape lower edge is removed.
4) Confirm at each mode (PLAY, F.SEARCH, R. SEARCH, F.F and REW) that the tape runs along the lower flange and that no curling occurs.

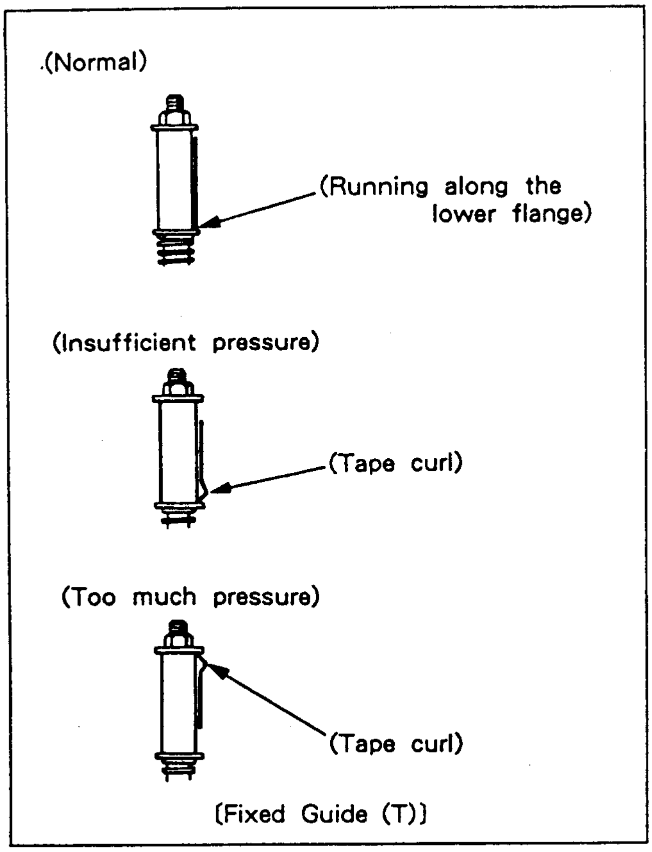

(Normal)
(Running along the lower flange)
(Insufficient pressure)
(Tape curl)
(Too much pressure)
(Tape curl)
[Fixed Guide (T)]

Fig. 6-4-7

6-4-6. COMPL Head Bracket (ACE Head) Adjustment

(1) Height Adjustment and Azimuth Adjustment (See Fig. 6-4-8.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
2) Monitor the audio output waveform with the oscilloscope.
3) Rotate the azimuth adjustment screw until the audio output waveform amplitude is maximum.
4) After loosening the ACE head height adjustment special nut, rotate it slowly clockwise until amplitude of the audio output waveform is maximum, then adjust it finely clockwise to the point just before the said waveform amplitude begins to decrease.
5) Rotate the azimuth adjustment screw until amplitude of the audio output waveform is maximum.
6) Confirm that the audio output waveform amplitude does not fluctuate.

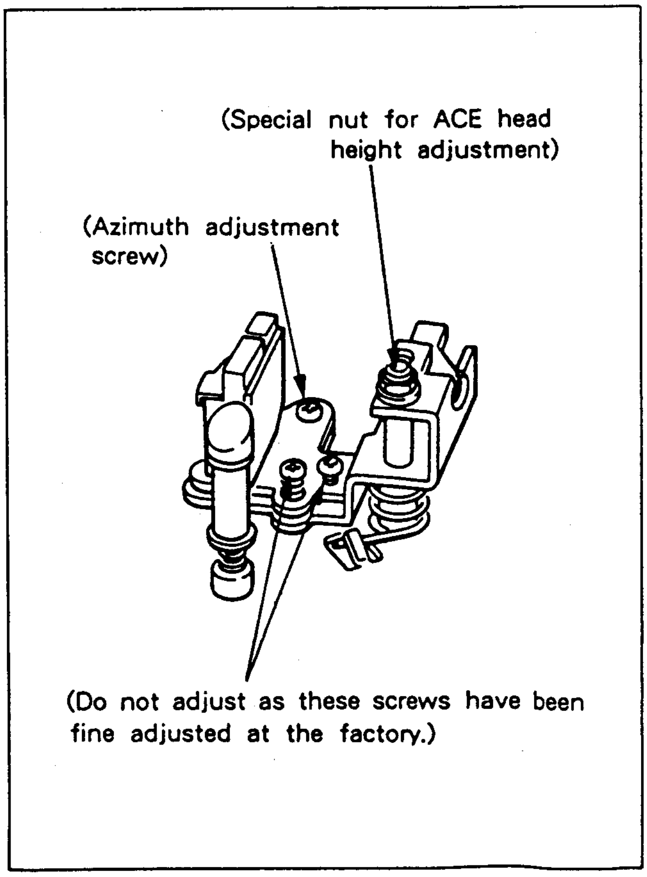

(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Do not adjust as these screws have been fine adjusted at the factory.)

Fig. 6-4-8

(2) Tracking (X Value) Adjustment (See Fig. 6-4-9.)

1) Load the alignment tape (H-7099-175-H) and set the PLAY mode.
2) Set tracking to the center position with the tracking control key (See Note below).
3) Rotate the stopper bracket fixing screw 180° counterclockwise.
4) Monitor the video head output envelope waveform with the oscilloscope.
5) Adjust the stopper bracket position so that amplitude of the envelope waveform becomes maximum at the tracking center and the envelope waveform amplitude changes by the same amount when shifting the tracking center by pressing the plus (+) and minus (−) tracking control keys.
6) Tighten the fixing screw.
7) Perform servo circuit channels 1/2 switching position adjustment (refer to Electrical Adjustment).

Note : For models equipped with auto tracking, always set to the manual tracking mode before adjustment. To confirm the tracking center position, press the tracking keys (+, −) and observe the front panel clock display. It will read "T − : −" at the tracking center, "T − : , T − − : " when keeping the minus (−) key pressed, and "T : −, T : − −" when keeping the plus (+) key pressed. The time indication will be restored 2 to 3 seconds after the tracking keys are released.

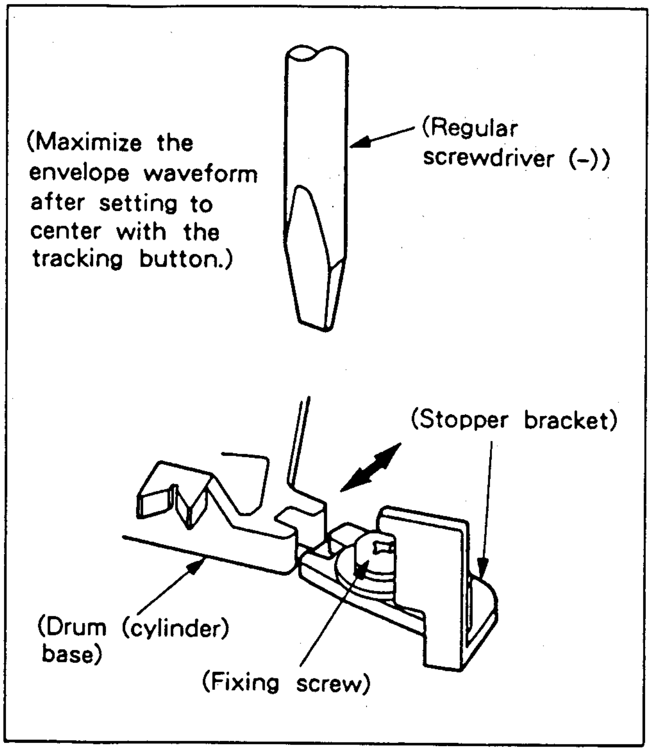

(Maximize the envelope waveform after setting to center with the tracking button.)
(Regular screwdriver (-))
(Stopper bracket)
(Drum (cylinder) base)
(Fixing screw)

Fig. 6-4-9

6-4-7. Checking after Adjustment

1) Play back the alignment tape (H-7099-175-H) and confirm that the envelope waveform rise immediately, and that there is no fluctuation in the envelope and audio output waveforms.
2) Load an E-180 cassette, record it and play it back. Then, confirm again that the envelope waveform rise immediately, and that there is no fluctuation in the envelope and audio output waveforms (during recording, input a 1kHz signal to the audio input terminals. Be sure to use an unspoiled E-180 cassette).
3) Set the PLAY mode, then turn power OFF (INITIAL mode) and set the PLAY mode again. Confirm that the envelope waveform rise immediately. Also check that the tape is not bent around the pinch rollers.
4) Confirm that the envelope waveform rise immediately, after changing from the FF, REW, F.SEARCH and R.SEARCH modes into PLAY. Also check that the tape is not bent around the pinch rollers.
5) Confirm that no tape curling or sliding-up occurs at the upper and lower flanges of the tape guides in the PLAY, FF, REW, F.SEARCH and R. SEARCH modes.
6) In the PLAY mode, confirm that the tape runs as shown in Fig. 6-4-10.

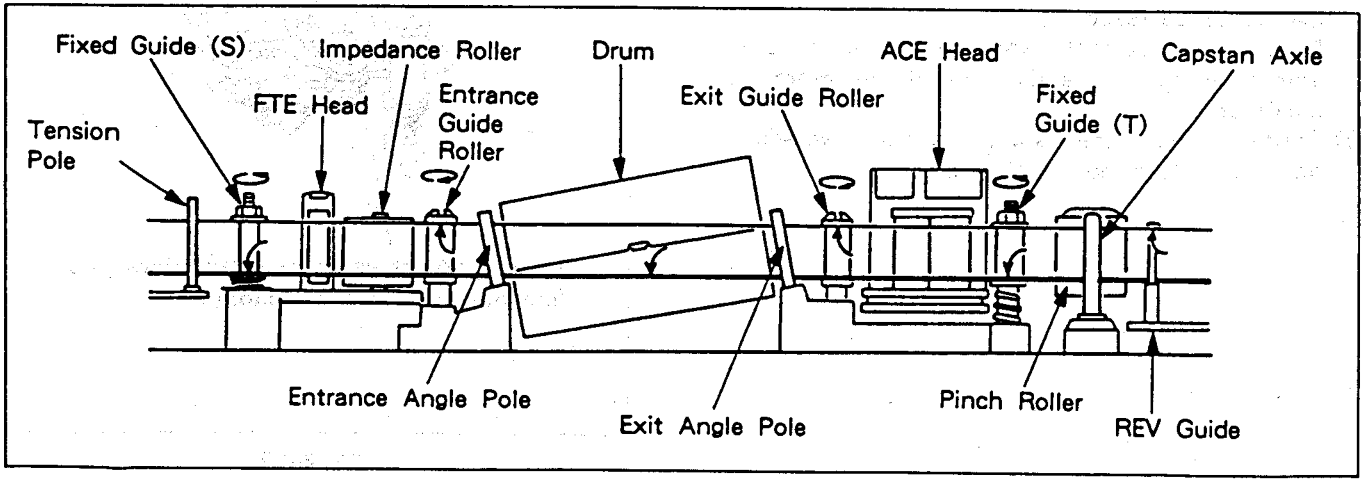

Fixed Guide (S)
Impedance Roller
Drum
ACE Head
Capstan Axle
Tension Pole
FTE Head
Entrance Guide Roller
Exit Guide Roller
Fixed Guide (T)
Entrance Angle Pole
Exit Angle Pole
Pinch Roller
REV Guide

Fig. 6-4-10

SECTION 6
ELECTRICAL ADJUSTMENTS

1. CIRCUIT BOARD LOCATIONS

1-1. MAIN BOARDS

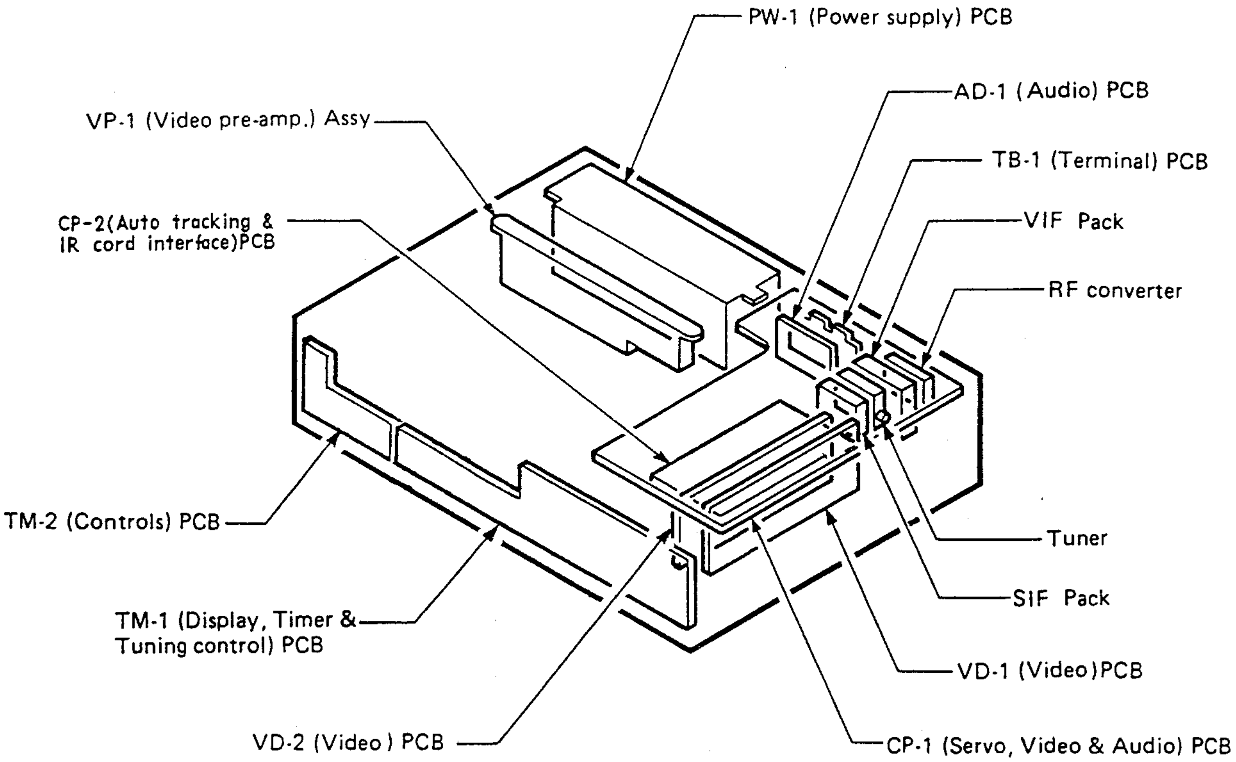

PW-1 (Power supply) PCB
AD-1 (Audio) PCB
VP-1 (Video pre-amp.) Assy
TB-1 (Terminal) PCB
CP-2(Auto tracking & IR cord interface)PCB
VIF Pack
RF converter
TM-2 (Controls) PCB
Tuner
TM-1 (Display, Timer & Tuning control) PCB
SIF Pack
VD-1 (Video)PCB
VD-2 (Video) PCB
CP-1 (Servo, Video & Audio) PCB

Fig. 1-1

1-2. LOCATION FOR TAPE PATH ADJUSTMENT

NOTE: The terminal (CN183) for tape path adjustment is shown in figure below.
For adjustment, refer to the separate volume "Mechanism Service Technical Information".

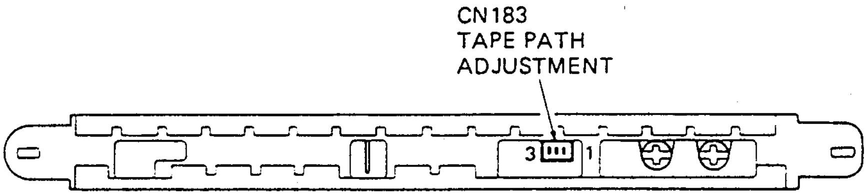

CN183
TAPE PATH
ADJUSTMENT
3
1

Fig. 1-2 Pre-amp Unit

2. ELECTRICAL ADJUSTMENT

2-1. PREPARATION

2-1-1. EQUIPMENT

- Colour TV monitor
- PAL Colour-bar generator (with RF and LINE OUTPUT)
- Audio signal generator
- Oscilloscope (dual trace; frequency response: 10MHz or more; probe: 10:1)
- Frequency counter (countable to 10MHz or higher)
- Digital voltmeter
- AC voltmeter
- In/output probes

2-1-2. SET-UP

Because the RF input signal is used for circuit adjustments, connect the colour-bar generator to the ANT IN terminal of the VCR. The RF input signal is processed by the tuner and IF circuit. It is important that the video output signal of the IF circuit satisfies the items shown in Fig. 2-1-3. Connect the oscilloscope to the VIDEO OUTPUT terminal of the video circuit and terminal with a 75Ω load, and then check the video output signal.

- The amplitude of the sync signal should be approximately 0.3 Vp-p.
- The amplitude of the video signal should be approximately 0.7 Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the colour burst amplitude is approximately 0.3 Vp-p.

[Alignment Tape (MH-2)] (H-7099-052-H)

In making the adjustment, an alignment tape for VHS (PAL). If a model is specified, be sure to use a tape of the model. If not either model of a tape can be used.

	Time	Video signal	Audio signal
1	10 minutes	Stair-step	6 kHz
2	5 minutes	———	3 kHz
3	10 minutes	Color bar	1 kHz
4	3 minutes	RF sweep	———

- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.

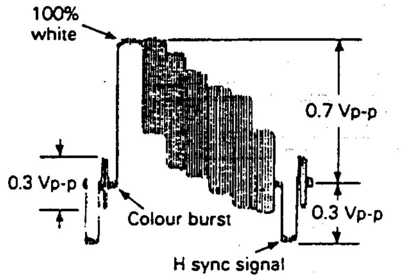

100% white
0.7 Vp-p
0.3 Vp-p
Colour burst
0.3 Vp-p
H sync signal

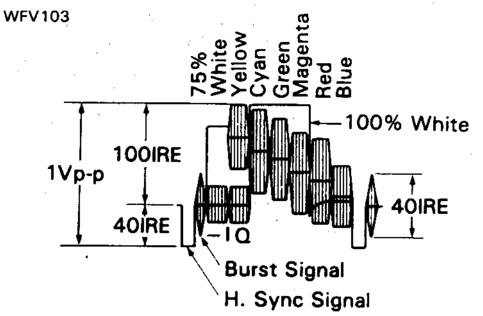
Fig. 2.1.3 (A)

[Alignment Tape (MH-1)] (H-7099-046-H)

In making the adjustment, an alignment tape for VHS (PAL). If a model is specified, be sure to use a tape of the model. If not either model of a tape can be used.

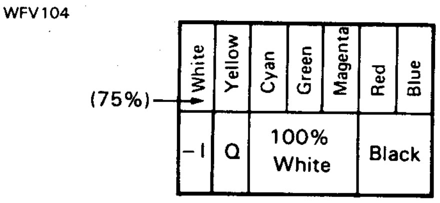
	Time	Video signal	Audio signal
1	10 minutes	Stair-step	7 kHz
2	5 minutes	———	3 kHz
3	10 minutes	Color bar	1 kHz
4	3 minutes	RF sweep	———

- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.


WFV103
75% White
Yellow
Cyan
Green
Magenta
Red
Blue
100% White
100IRE
1Vp-p
40IRE
−IQ
40IRE
Burst Signal
H. Sync Signal

COLOR BAR SIGNAL WAVEFORM (MH-1)

Fig. 2.1.3 (B)

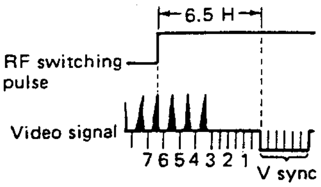
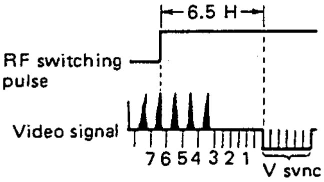

WFV104
(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
−I
Q
100% White
Black

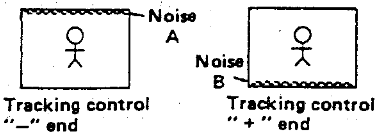
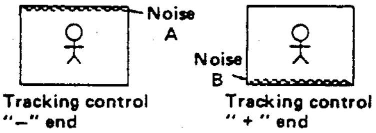
COLOR BAR PATTERN (MH-1) ON MONITOR TV

Fig. 2.1.3 (C)

2-2. SERVO CIRCUIT ADJUSTMENT ..... CP-1 PCB

NOTE (1): These adjustments should be carried out upon completion of the transport adjustments.
(2): If the tape transport adjustments are carried out after these adjustments, follow the procedures again in SWITCHING POSITIONS.

No.	Item	Input	Mode	Point	Location	Remark
1	SWITCHING POSITION for PAL SYSTEM	Alignment cassette (MH-2)	PLAY	VIDEO OUTPUT TP701 CN359 ① (trigger)	VR351	 6.5 H RF switching pulse Video signal 7 6 5 4 3 2 1 V sync 1. Select the SYSTEM switch to "AUTO" position. 2. Set the tracking control to the center position (on the display "T – : – "). 3. Adjust VR351 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ± 0.5 H from the rise of the RF switching pulse waveform.
2	SWITCHING POSITION for NTSC SYSTEM	Alignment cassette (MH-1)	PLAY	VIDEO OUTPUT TP701 CN359 ① (trigger)	VR352	 6.5 H RF switching pulse Video signal 7 6 5 4 3 2 1 V sync 1. Select the SYSTEM switch to "NTSC 3.58" position. 2. Set the tracking control to the center position (on the display "T – : – "). 3. Adjust VR352 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ± 0.5 H from the rise of the RF switching pulse waveform.
3	SP MODE STILL V-LOCK for PAL SYSTEM	Colour bar from Colour bar generator	REC ↓ PLAY ↓ STILL	TV screen	VR851 (Rear panel)	1. Select the SYSTEM switch to "AUTO" position. 2. Playback the recorded part, and put the VCR in the SP STILL mode. 3. Adjust VR851 so that the V jitter (very fine movement of the vertical sync) is minimized.

No.	Item	Input	Mode	Point	Location	Remark
4	SP MODE SLOW TRACKING for PAL SYSTEM	Colour bar from Colour bar generator	REC ↓ PLAY ↓ SLOW	TV screen	VR361	 Noise A Noise B Tracking control "–" end Tracking control " + " end 1. Put the VCR in the SP REC mode and record at the middle of the cassette tape. 2. Playback the recorded part, and VCR in the SP SLOW mode by remote control unit. 3. Set the tracking control to the center position (on the display " T –:– "). 4. Turn VR361, and move the noise out of the TV screen, while watching to the screen. 5. The noise position at which noise begins to appear at the upper edge of the TV screen is A, when the tracking control is turned to the "–" end. 6. The noise position at which noise begins to appear at the lower edge of the TV screen is B, when the tracking control is turned to the "+" end. 7. Reasjust VR361 so that the same level of noise A and noise B can be obtained.
5	LP MODE STILL V-LOCK for PAL SYSTEM	Colour bar from Colour bar generator	REC ↓ PLAY ↓ STILL	TV screen	VR852 (Rear panel)	1. Playback the recorded part, and put the VCR in the LP STILL mode. 2. Adjust VR852 so that the V jitter (very fine movement of the vertical sync) is minimized.
6	LP MODE SLOW TRACKING for PAL SYSTEM	Colour bar from Colour bar generator	REC ↓ PLAY ↓ SLOW	TV screen	VR362	 Noise A Noise B Tracking control "–" end Tracking control " + " end 1. Put the VCR in the LP REC mode and record at the middle of the cassette tape. 2. Playback the recorded part, and VCR in the LP SLOW mode by remote control unit. 3. Set the tracking control to the center position (on the display " T –:– "). 4. Turn VR362, and move the noise out of the TV screen, while watching to the screen. 5. The noise position at which noise begins to appear at the upper edge of the TV screen is A, when the tracking control is turned to the "–" end. 6. The noise position at which noise begins to appear at the lower edge of the TV screen is B, when the tracking control is turned to the "+" end. 7. Reasjust VR362 so that the same level of noise A and noise B can be obtained.

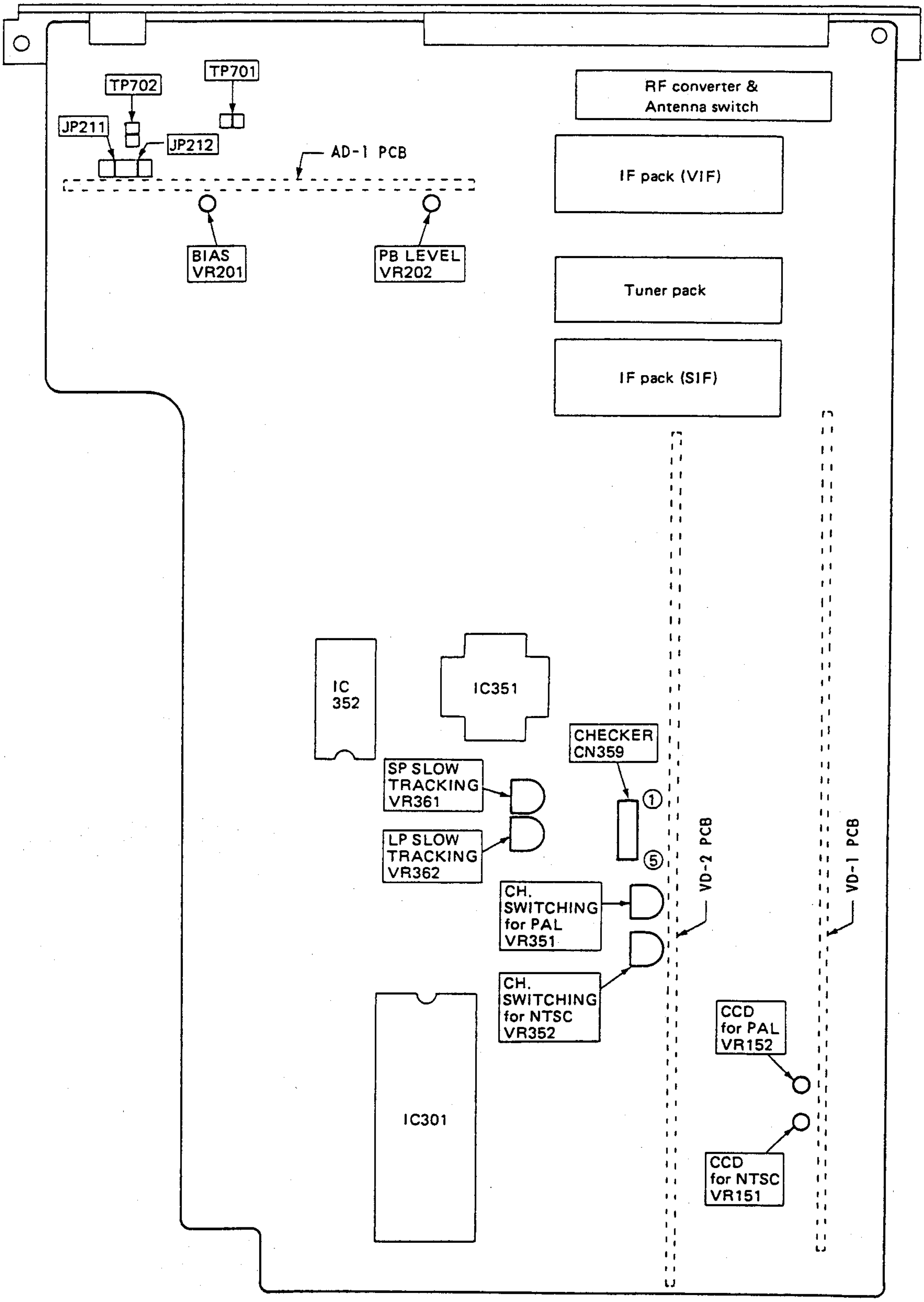

TP702
TP701
JP211
JP212
AD-1 PCB
RF converter & Antenna switch
IF pack (VIF)
BIAS VR201
PB LEVEL VR202
Tuner pack
IF pack (SIF)
IC 352
IC351
CHECKER CN359
SP SLOW TRACKING VR361
LP SLOW TRACKING VR362
①
⑤
VD-2 PCB
VD-1 PCB
CH. SWITCHING for PAL VR351
CH. SWITCHING for NTSC VR352
CCD for PAL VR152
IC301
CCD for NTSC VR151

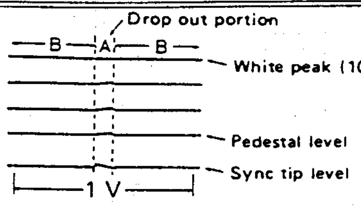
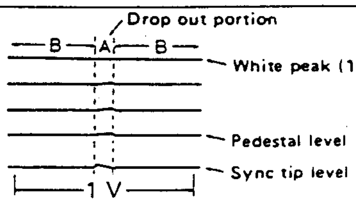
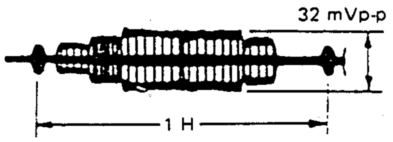
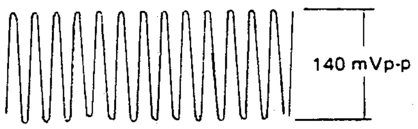
Fig. 2-2-1 CP-1 PCB (Foil side view)

2-3. VIDEO CIRCUIT ADJUSTMENT ... CP-1 PCB and VP-1 Assy

NOTE

(1): 'No-signal REC mode' is not to supply any signal to VIDEO INPUT terminal.

(2): The VR152, VR151 (on VD-1 PCB) are accessible from the foil side of CP-1 PCB

No.	Item	Input	Mode	Point	Location	Remark
1	CCD LEVEL for PAL SYSTEM	Alignment cassette (MH-2)	PLAY	VIDEO OUTPUT TP701 (CP-1 PCB)	VR152	 Drop out portion B A B White peak (100%) Pedestal level Sync tip level 1 V 1. Select the SYSTEM switch to "AUTO" position. 2. Set the horizontal scale (TIME/DIV) of the oscilloscope to 1 msec./div.. 3. Adjust VR152 so that the drop out portion "A" of white peak (100%) and other portion "B" are same level.
2	CCD LEVEL for NTSC SYSTEM	Alignment cassette (MH-1)	PLAY	VIDEO OUTPUT TP701 (CP-1 PCB)	VR151	 Drop out portion B A B White peak (100%) Pedestal level Sync tip level 1 V 1. Select the SYSTEM switch to "NTSC 3.58" position. 2. Set the horizontal scale (TIME/DIV) of the oscilloscope to 1 msec./div.. 3. Adjust VR151 so that the drop out portion "A" of white peak (100%) and other portion "B" are same level.
3	CHRO-MINANCE SIGNAL RECORD-ING CURRENT	Colour bar from Colour bar generator	LP RECORD	TP181 (HOT) shield case (GND) (Pre-amp)	VR181	 1. Select the SYSTEM switch to "AUTO" position. 2. Turn VR182 all the way to the right (to the minimum level). 3. Adjust VR181 so that the level is 32 ± 2 mVp-p.
4	LUMIN-ANCE SIGNAL RECORD-ING CURRENT	None	LP RECORD	TP181 (HOT) shield case (GND) (Pre-amp)	VR182	 1. Set the channel selector buttons to AV position and put the VCR in the no-signal REC mode. 2. Adjust VR182 so that the level is 140 ± 5 mVp-p.

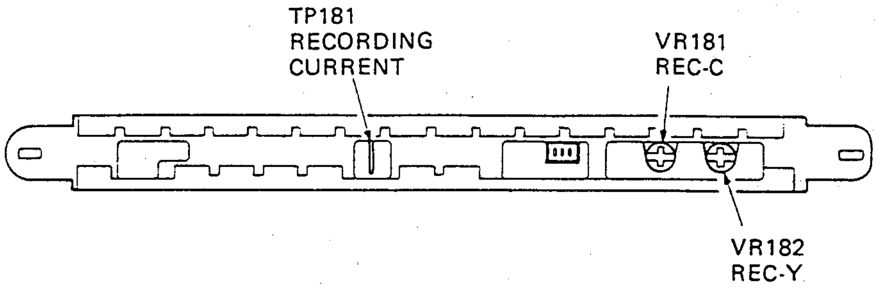


Fig. 2-3-1 Pre-amp Unit

2-4. AUDIO CIRCUIT ADJUSTMENT ... CP-1 and AD-1 PCB

NOTE (1) : No-signal record mode' is not to supply any signal to AUDIO INPUT terminal.
(2) : VR201 and VR202 (on the AD-1 PCB) are accessible from the foil side of CP-1 PCB (see Fig. 2-2-1).

No.	Item	Input	Mode	Point	Location	Remark
1	BIAS	No-signal	REC	JP212 JP211 (GND)	VR201	1. Press the Channel selector buttons to "AV" position and put the VCR in the no-signal REC mode. 2. Adjust VR201 so that the level is 25 mVrms.
2	PLAYBACK OUTPUT LEVEL	Audio signal (1 KHz, −8 dBs) from Audio signal generator	REC ↓ PLAY	AUDIO OUTPUT terminal	VR202	1. Set the VCR in the "AUTO" position. 2. Adjust VR202 so that the recorded 1 kHz output level becomes −8 dBs in the PLAY mode.

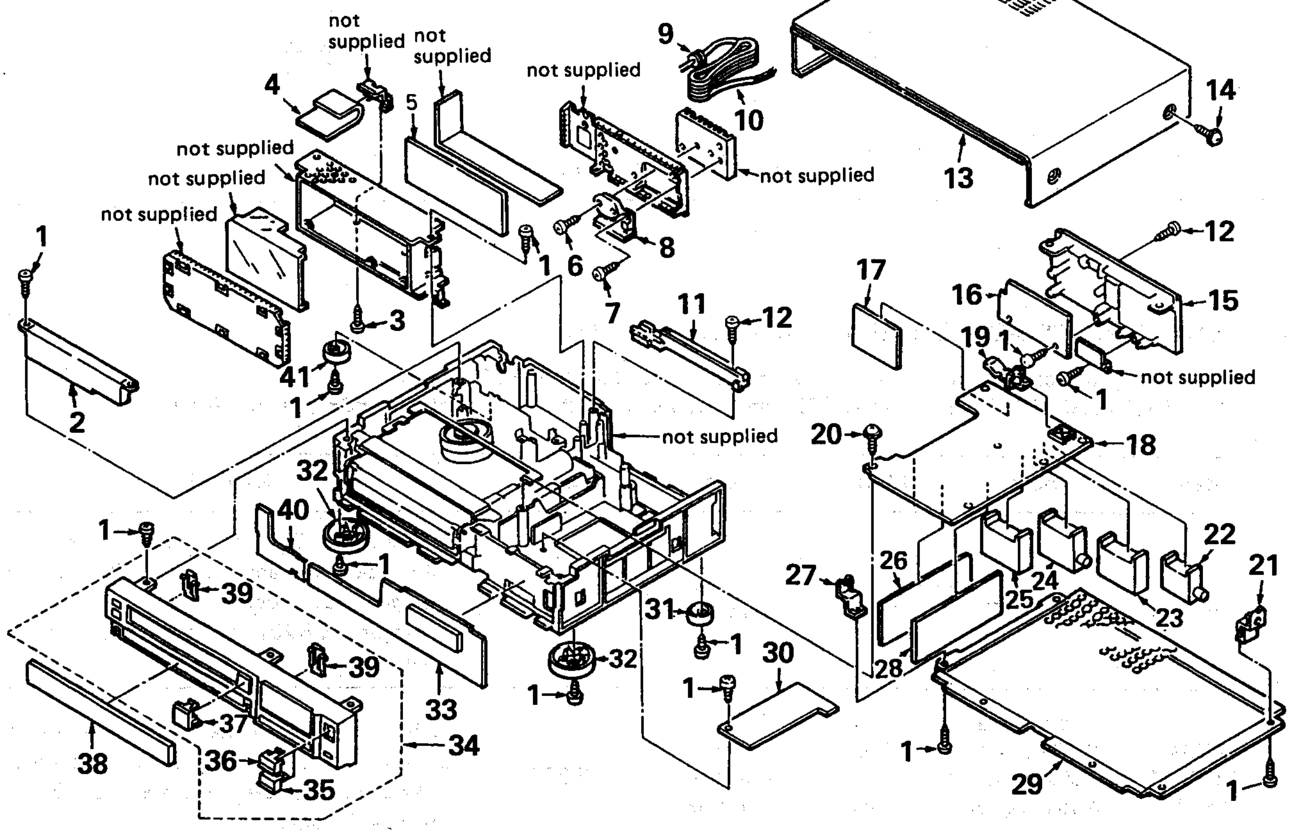
SECTION 7
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) . . . KNOB, BALANCE (WHITE)
  ↑ Cabinet's Color ↑ Parts Color

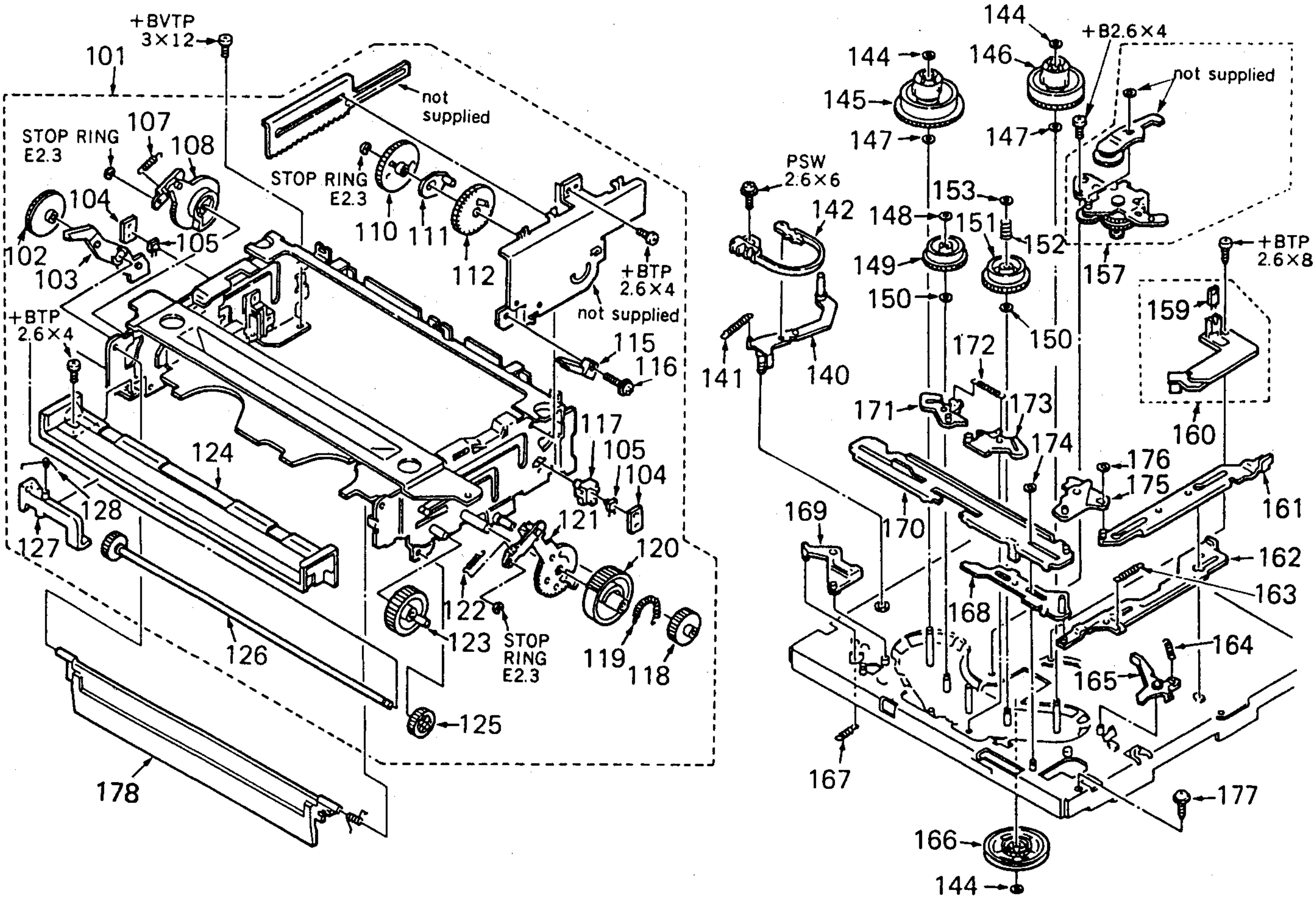
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

1. CABINET & CHASSIS PARTS



No.	Part No.	Description	Remark
1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
2	*A-6725-915-A	VP-1 BOARD, COMPLETE	
3	3-741-477-01	BIN (+BV) (3X12)	
4	3-735-734-01	LID	
5	*A-6725-901-A	PW-1 BOARD, COMPLETE	
6	7-685-650-21	SCREW +BVTP 3X16 TYPE2 SLIT	
7	3-746-714-01	SCREW (3X12), SPECIAL	
8	*A-6725-902-A	PW-2 BOARD, COMPLETE	
9	3-741-474-01	FIXER	
10	⚠1-590-005-11	CORD, PWOER	
11	3-740-337-01	BLIND	
12	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
13	3-749-070-01	COVER, TOP	
14	3-740-334-01	SCREW, SPECIAL	
15	1-569-138-11	TERMINAL	
16	*A-6725-910-A	TB-1 BOARD, COMPLETE	
17	*A-6725-911-A	AD-1 BOARD, COMPLETE	
18	*A-6725-920-A	CP-A BOARD, COMPLETE	
19	3-747-604-01	SPRING PLATE	
20	7-685-647-79	SCREW +BTP 3X10 TYPE2 N-S	
21	3-747-614-01	BRACKET	
22	1-466-449-11	MODULATOR, RF	
23	1-466-447-11	IF PACK (V-IF)	
24	1-465-619-11	TUNER	
25	1-466-448-11	IF PACK (S-IF)	
26	*A-6725-916-A	VD-2 BOARD, COMPLETE	
27	3-747-613-01	BRACKET	
28	*A-6725-917-A	VD-1 BOARD, COMPLETE	
29	*3-740-325-01	COVER, BOTTOM	
30	*A-6725-918-A	CP-2 BOARD, COMPLETE	
31	3-740-333-01	STAND (B)	
32	3-740-327-01	STAND (F)	
33	*A-6725-919-A	TM-1 BOARD, COMPLETE	
34	A-6704-448-A	CABINET ASSY, FRONT	
35	3-749-078-01	BUTTON (CH) (-)	
36	3-749-077-01	BUTTON (CH) (+)	
37	3-749-080-01	BUTTON (EJECT)	
38	A-6704-449-A	DOOR ASSY	
39	3-740-330-01	LOCK	
40	*A-6725-921-A	TM-2 BOARD, COMPLETE	
41	3-740-332-01	STAND (A)	

2. MECHANISM SECTION (1)



+BVTP
3×12
101
not supplied
STOP RING
E2.3
107
108
104
102
105
103
STOP RING
E2.3
110
111
112
+BTP
2.6×4
not supplied
+BTP
2.6×4
115
116
117
105
104
124
121
120
128
127
122
123
STOP RING
E2.3
119
118
126
125
178
144
+B2.6×4
146
144
not supplied
145
147
147
PSW
2.6×6
142
153
148
151
152
157
149
150
+BTP
2.6×8
159
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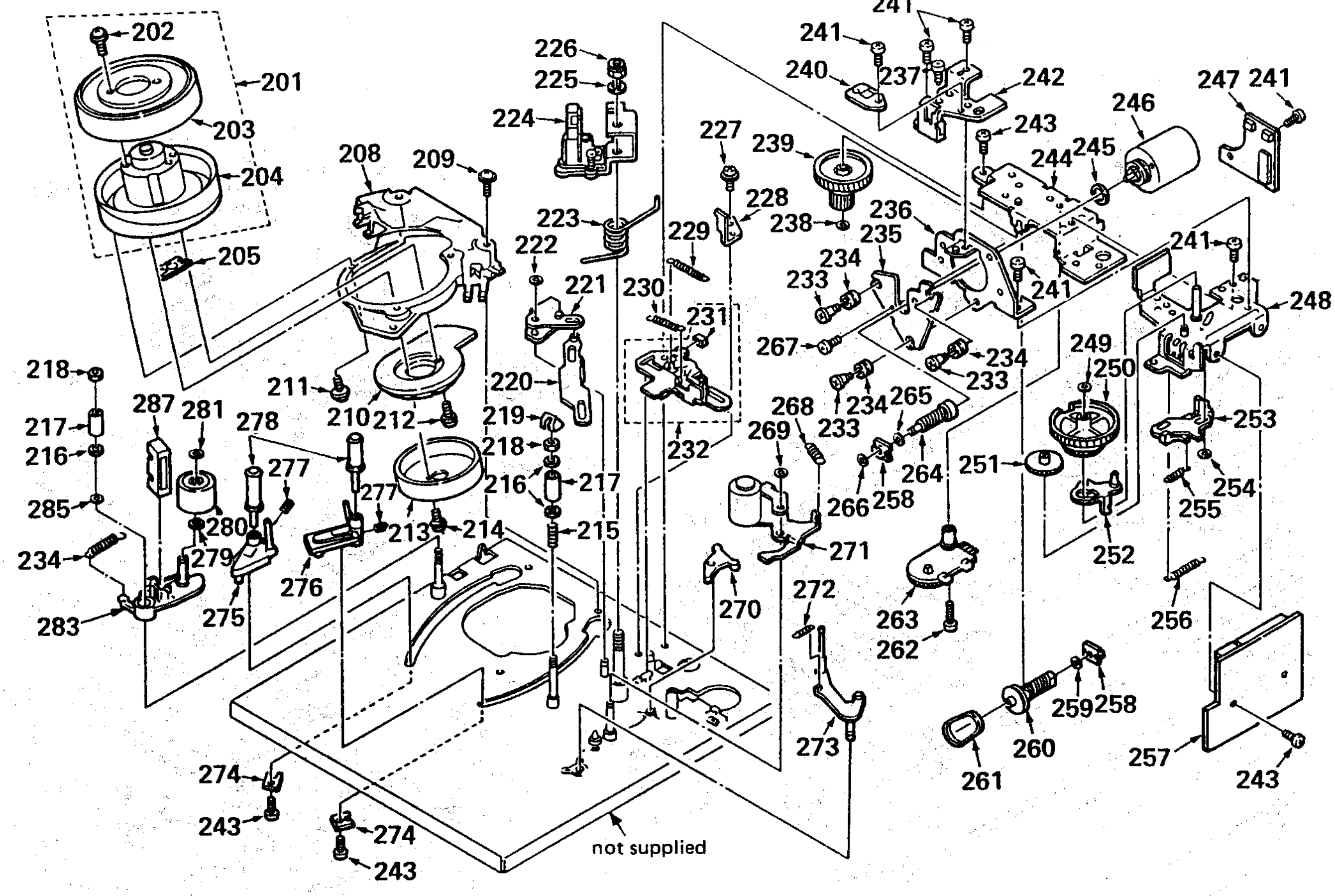
No.	Part No.	Description	Remark
101	A-6751-437-A	CASSETTE COMPARTMENT ASSY	
102	3-735-722-01	GEAR, IDLER (LEFT)	
103	3-735-721-01	DOOR, SWITCHING LINK	
104	3-735-734-01	LID	
105	1-808-710-11	PHOTO TRANSISTOR	
107	3-735-720-01	SPRING	
108	3-735-719-01	LEVER (L) ASSY, GEAR	
110	3-735-731-01	GEAR, LOCK	
111	3-735-732-01	LEVER ASSY, PINION	
112	3-735-730-01	GEAR, PINION	
115	3-735-729-01	SW, LEAF	
116	3-735-775-01	SCREW (2X9), +PSW	
117	*3-735-733-01	HOLDER, TR	
118	3-735-728-01	GEAR, IDLER	
119	3-735-725-01	SPRING	
120	3-735-724-01	GEAR, MAIN	
121	3-735-723-01	GEAR ASSY, LEVER	
122	3-735-726-01	SPRING	
123	3-735-727-01	GEAR, IDLER (RIGHT)	
124	3-735-716-01	FRAME, LOWER	
125	3-735-718-01	GEAR (R)	
126	3-735-717-01	ROD ASSY	
127	3-735-715-01	LEVER, SAFETY SW	
128	3-735-714-01	SPRING	
140	3-740-352-01	LEVER ASSY, TENSION	
141	3-735-654-01	SPRING	
142	3-735-690-01	HOLDER ASSY, BAND	
144	3-735-755-01	WASHER (DIA.2.6)	
145	3-735-624-01	REEL ASSY, SUPPLY	
146	3-735-623-01	REEL ASSY, TAKE-UP	
147	3-735-754-01	WASHER (DIA.3), ADJUSTMENT	
147	3-735-754-01	WASHER (DIA.3), ADJUSTMENT	
147	3-735-754-01	WASHER (DIA.3), ADJUSTMENT	
148	3-735-774-01	WASHER (DIA.2)	
149	3-735-620-01	GEAR, SUPPLY REEL	
150	3-735-750-01	WASHER (DIA.2.6), SPECIAL	
151	3-735-621-01	GEAR, TAKE-UP REEL	
152	3-735-622-01	SPRING (T)	
153	3-735-774-01	WASHER (DIA.2)	
157	X-3740-301-1	CLUTCH ASSY, IDLER	
159	1-808-722-11	DIODE LN59 (LED)	
160	*1-589-222-11	PCB ASSY, MC-4	
161	*3-735-662-01	PLATE ASSY, SLIDE	
162	*3-735-626-01	BRAKE (C) ASSY	
163	3-735-627-01	SPRING	
164	3-735-665-01	SPRING	
165	3-735-664-01	BRAKE SUB ASSY, T	
166	3-735-652-01	PULLEY	
167	3-740-348-01	SPRING	
168	*3-735-628-01	BRAKE, SLIDE ACT	
169	3-735-655-01	BRAKE SUB, S	
170	*3-735-661-01	PLATE ASSY, SLIDE	
171	3-735-656-01	BRAKE ASSY, S	
172	3-735-658-01	SPRING	
173	3-735-657-01	BRAKE ASSY, T	
174	3-735-761-01	WASHER (DIA.2.6)	
175	3-735-663-01	LEVER, CONTROL	
176	3-735-774-01	WASHER (DIA.2)	
177	3-735-745-01	SCREW (4X12), +T TP	
178	3-749-120-01	DOOR, CASSETTE	

3. MECHANISM SECTION (2)



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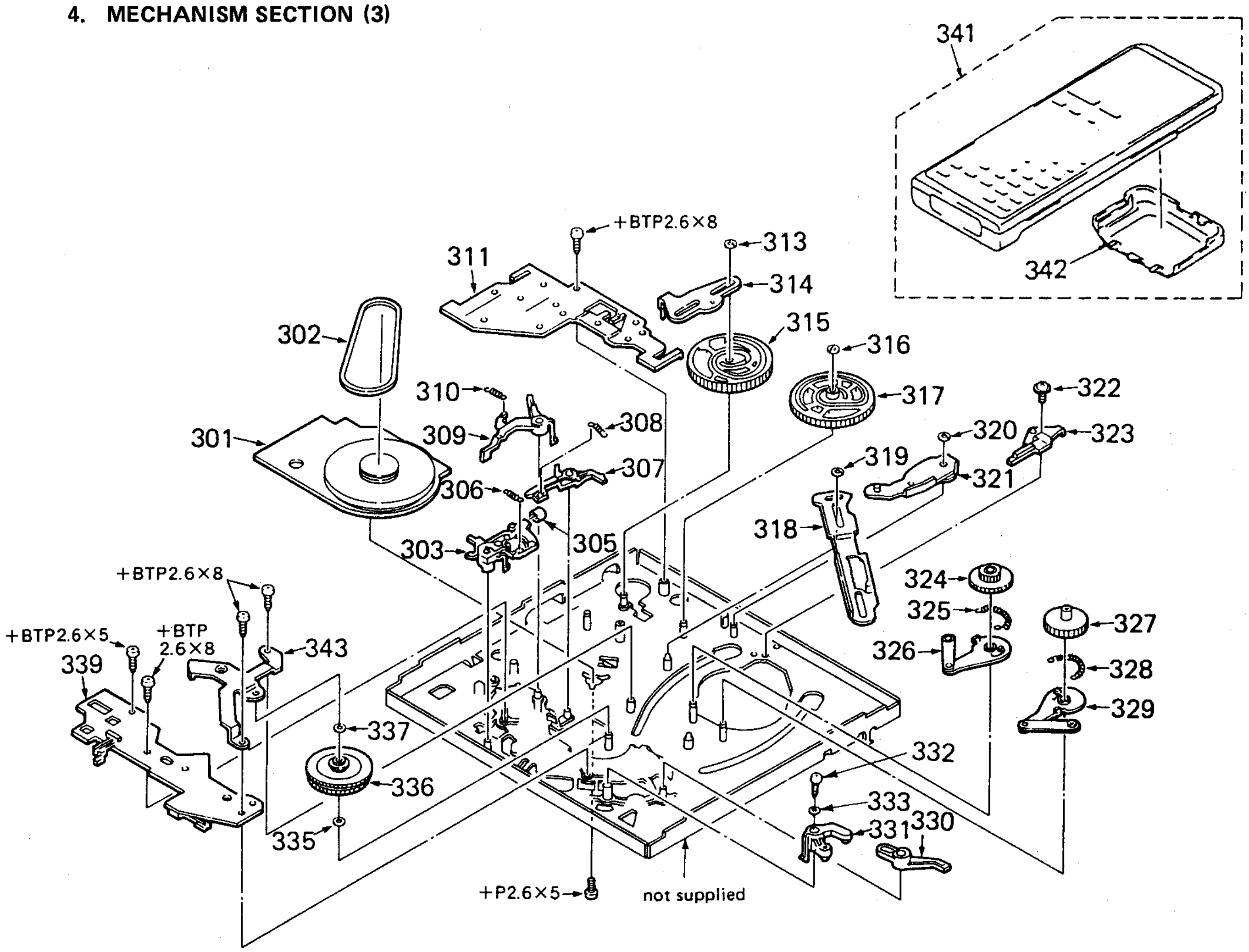
No.	Part No.	Description	Remark
201	A-6050-719-A	COMPLETE PCB, 2N4P-V CYLINDER	
202	3-735-776-01	SCREW (3X8), +PW	
203	3-749-150-01	CYLINDER (UPPER) ASSY	
204	3-746-722-01	CYLINDER (LOWER) ASSY	
205	3-735-738-01	SPACER, MOTOR	
208	*3-735-737-01	CYLINDER BASE	
209	3-735-748-01	SCREW (3X6), +PWH	
210	1-462-284-11	STATOR	
211	3-735-777-01	SCREW (2.6X8), +PWH	
212	3-735-779-01	SCREW (2.3X8), +PSW	
213	*1-461-017-11	ROTOR	
214	3-735-778-01	SCREW (2.3X6), +PSW	
215	3-735-677-01	SPRING	
216	3-741-408-01	WASHER, SPECIAL	
217	3-735-676-01	GUIDE, TAPE	
218	7-684-023-04	NUT (DIA.3), SPECIAL	
219	3-740-328-01	CAP	
220	*3-735-672-01	SLIDE ASSY, PINCH	
221	*3-735-673-01	PINCH LEVER ASSY	
222	3-735-759-01	WASHER (DIA.3)	
223	3-735-680-01	SPRING	
224	3-735-679-01	BRACKET, COMPL	
225	3-735-681-01	SPACER	
226	3-735-682-01	NUT (M5), SPECIAL	
228	*3-735-683-01	BRACKET, STOPPER	
229	3-735-669-01	SPRING	
230	3-735-670-01	SPRING	
231	3-735-668-01	DAMPER	
232	3-735-667-01	CAM ASSY, SLIDE	
233	3-749-089-01	SCREW, SPECIAL	
234	3-749-096-01	DAMPER, MOTOR	
235	3-749-095-01	STAND, MOTOR	
236	3-749-094-01	STAND, BRACKET	
238	*1-589-274-11	MC-2 BOARD, COMPLETE	
239	3-740-361-01	GEAR, HELICAL	
240	3-735-711-01	SENSOR ASSY, DEW	
242	*3-735-705-01	BRACKET, HOLDER	
244	3-749-079-01	BUTTON (RECORD)	
245	3-735-708-01	DAMPER, WORM	

No.	Part No.	Description	Remark
246	3-735-707-01	MOTOR ASSY, L	
247	*1-589-275-11	MC-3 BOARD, COMPLETE	
248	*3-735-698-01	BRACKET ASSY, F	
249	3-701-441-21	WASHER (DIA.4)	
250	3-735-703-01	GEAR (F), HELICAL	
251	3-735-704-01	GEAR	
252	*3-735-699-01	LEVER ASSY, F	
253	*3-735-700-01	SLIDE ASSY, F	
254	3-735-756-01	WASHER (DIA.3)	
255	3-735-702-01	SPRING	
256	3-735-701-01	SPRING	
257	*1-589-274-11	MC-2 BOARD, COMPLETE	
258	3-735-696-01	HOLDER, WORM	
259	3-735-774-01	WASHER (DIA.2)	
260	3-749-093-01	LOAD ASSY, WORM	
261	3-735-709-01	BELT (LOADING)	
263	1-572-383-11	SWITCH, ROTARY	
264	3-735-706-01	WORM ASSY, F	
265	3-749-091-01	WASHER	
266	3-741-412-01	WASHER, SPECIAL	
267	7-621-775-08	SCREW +P 2.6X3	
268	3-735-675-01	SPRING	
269	3-735-757-01	WASHER (DIA.3.6)	
270	3-735-671-01	LEVER, ACT BRAKE	
271	3-735-674-01	PINCH ROLLER, COMPL	
272	3-735-660-01	SPRING	
273	3-735-659-01	LEVER ASSY, REV (G)	
274	3-735-631-01	PLATE, GUIDE	
275	3-735-629-01	ROLLER (S) ASSY, BASE	
276	3-735-632-01	ROLLER (T) ASSY, BASE	
278	3-735-630-01	ROLLER ASSY, GUIDE	
279	3-735-771-01	WASHER (DIA.2), SPECIAL	
280	3-749-021-01	ROLLER, IMPEDANCE	
281	3-735-769-01	WASHER (DIA. 1.5)	
283	3-735-684-01	LEVER ASSY, FE MEAD	
284	3-735-686-01	SPRING	
285	3-735-770-01	WASHER (DIA.6)	
287	3-735-687-01	HEAD, FTE	

4. MECHANISM SECTION (3)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No.	Part No.	Description	Remark
301	3-749-090-01	MOTOR, CAPSTAN	
302	3-735-691-01	BELT (REEL DRIVE)	
303	3-747-602-01	CLUTCH ASSY, LEVER	
305	3-735-645-01	DAMPER, LEVER CLUTCH	
306	3-735-646-01	SPRING	
307	3-735-647-01	LEVER, CONVERSION CLUTCH	
308	3-735-648-01	SPRING	
309	3-735-649-01	BRAKE ASSY, CAP	
310	3-741-405-01	SPRIMG	
311	*3-735-692-01	BRACKET	
313	3-735-759-01	WASHER (DIA.3)	
314	*3-735-643-01	PLATE ASSY, CAM	
315	3-735-639-01	CAM, MODE	
316	3-735-756-01	WASHER (DIA.3)	
317	3-735-640-01	CAM, MAIN	
318	3-735-642-01	RACK, LOAD	
319	3-735-758-01	WASHER (DIA.2.6)	
320	3-735-757-01	WASHER (DIA.3.6)	
321	3-735-641-01	LEVER ASSY, LOAD CAM	
322	7-682-903-01	SCREW (3X4), +PWH	
323	3-735-693-01	PLATE ASSY, GROUND	
324	3-749-022-01	GEAR (T)	
325	3-735-637-01	SPRING (T)	
326	3-735-636-01	LOAD (T) ASSY, LEVER	
327	3-746-724-01	GEAR (S)	
328	3-735-634-01	SPRING	
329	3-735-633-01	LOAD (S) ASSY, LEVER	
330	3-735-766-01	LEVER, RETURN TENSION	
331	3-735-666-01	LEVER ASSY, CONTROL	
332	3-735-762-01	SCREW (2.3X12), +PTP	
	3-735-763-01	SCREW (2.3X5), +PTP	
333	3-735-764-01	WASHER (DIA.2.3)	
	3-735-761-01	WASHER (DIA.2.6)	
335	3-735-760-01	WASHER (DIA.3), SPECIAL	
336	3-741-402-01	GEAR, FRICTION	
337	3-735-755-01	WASHER (DIA.2.6)	
339	*1-589-219-11	COMPL, MC-1	
339-1	1-571-931-11	SWITCH, LEAF (FRONT LOADING) (MC-1)	
339-2	1-571-932-11	SWITCH, LEAF (ERASURE-PREVENSION) (MC-1)	
339-3	1-808-723-11	PHOTO COUPLER (T REEL SENSOR) (MC-1)	
339-4	3-735-744-01	SPACER, PHOTO SENSOR (MC-1)	
341	1-465-547-11	REMOTE CONTROL (RMT-V90)	
342	2-181-754-01	LID, BATTERY CASE	
343	3-740-397-01	BRACKET PULLEY	

PW-1 **PW-2** **TB-1**

SECTION 8
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: µF, PF: µµF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: µH

SEMICONDUCTORS
In each case, U: µ, for example:
UA...: µA..., UPA...: µPA...,
UPC...: µPC, UPD...: µPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
	*A-6725-901-A	PW-1 BOARD, COMPLETE *********************				
		CAPACITOR				
C5001	1-130-679-11	FILM	0.068MF	20%	250V	
C5002⚠.	1-136-344-11	FILM	0.0047MF	20%	250V	
C5003	1-126-990-11	ELECT	82MF		400V	
C5004	1-137-089-11	CERAMIC	0.047MF		630V	
C5005	1-164-365-11	CERAMIC	680PF			
C5007	1-124-443-00	ELECT	22MF	20%	10V	
C5008	1-136-163-00	FILM	0.068MF	5%	50V	
C5009	1-136-165-00	FILM	0.1MF	5%	50V	
C5010	1-130-475-00	MYLAR	0.0027MF	10%	50V	
C5021⚠.	1-161-741-00	CERAMIC	0.001MF	10%	400V	
C5022⚠.	1-161-741-00	CERAMIC	0.001MF	10%	400V	
C5024⚠.	1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C5025⚠.	1-161-742-00	CERAMIC	0.0022MF	20%	400V	
C5101	1-123-336-00	ELECT	470MF	20%	25V	
C5102	1-123-336-00	ELECT	470MF	20%	25V	
C5103	1-123-334-00	ELECT	220MF	20%	25V	
C5104	1-124-559-51	ELECT	1000MF	20%	10V	
C5105	1-126-103-11	ELECT	470MF	20%	10V	
C5106	1-124-910-11	ELECT	47MF	20%	50V	
C5107	1-124-910-11	ELECT	47MF	20%	50V	
C5108	1-126-176-11	ELECT	220MF	20%	10V	
C5111	1-124-910-11	ELECT	47MF		35V	
C5112	1-124-910-11	ELECT	47MF		35V	
		CONNECTOR				
CN501⚠.	- - -		3P			
CN511	- - -		3P			
CN512	- - -		6P			
CN513	- - -		6P			
		DIODE				
D5001	1-808-901-11	DIODE LB156-LF-A				
D5002	1-808-898-11	DIODE APOIC-VO				
D5003	1-808-898-11	DIODE APOIC-VO				
D5004	1-809-009-11	DIODE 1SS244-T-77				
D5005	1-809-009-11	DIODE 1SS244-T-77				
D5007	8-719-109-81	DIODE RD4.7ES-B2				
D5008	8-719-912-20	DIODE 1SS120				
D5009	8-719-912-20	DIODE 1SS120				
D5101	1-809-095-11	DIODE RL2Z-LF-B1				
D5102	1-809-095-11	DIODE RL2Z-LF-B1				
D5103	1-809-095-11	DIODE RL2Z-LF-B1				
D5104	1-808-899-11	DIODE AG01-V2				
D5105	1-809-009-11	DIODE 1SS244-T-77				
D5106	1-808-899-11	DIODE AG01-V2				
D5107	- - -	DIODE				
		FUSE				
F5001⚠.	1-532-203-00	FUSE, TIME-LAG (T.2A 250V)				
F5101⚠.	1-532-203-00	FUSE, TIME-LAG (T.1.6A 250V)				
F5102⚠.	1-532-824-11	FUSE, GLASS TUBE				
		IC				
IC501	1-808-900-11	IC STK73605				
		COIL				
L5001	1-412-357-11	CHOKE, LF (22MMH)				
L5101	1-412-464-11	INDUCTOR, COIL 33UH				
L5102	1-543-699-11	CORE				
		PROTECTER				
PR511	1-576-121-11	PROTECTER, CIRCUIT (ICP-F38)				
		RESISTOR				
R5002⚠.	1-219-126-11	CARBON	2.2		2W	
		TRANSFORMER				
T5001	1-572-188-11	SWITCH, TRANSFORMER				

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	*A-6725-902-A	PW-2 BOARD, COMPLETE *********************				
		CAPACITOR				
C5201	1-124-589-11	ELECT	47MF	20%	16V	
		IC				
IC521	1-808-853-11	IC STK5473				

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	*A-6725-910-A	TB-1 BOARD, COMPLETE *********************				
		SOCKET				
JK853	1-580-129-11	SOCKET (RCA) (AD OUT)				
JK854	1-580-130-11	SOCKET (RCA) (VD OUT)				
JK855	1-580-129-11	SOCKET (RCA) (AD IN)				
JK856	1-580-130-11	SOCKET (RCA) (VD IN)				
		SWITCH				
S8501	1-572-457-11	SWITCH, SLIDE 2-3				
		VARIABLE RESISTOR				
VR851	1-241-160-11	VR ROTARY 100K (V-LOCK PAL SP)				
VR852	1-241-160-11	VR ROTARY 100K (V-LOCK PAL LP)				

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Ref.No	Part No.	Description				Remark
	*A-6725-911-A	AD-1 BOARD, COMPLETE *********************				
		TRANSISTOR				
B2041	8-729-900-89	TRANSISTOR DTC144ES				
B2043	8-729-900-89	TRANSISTOR DTC144ES				
		CAPACITOR				
C2001	1-124-438-00	ELECT	1MF	20%	50V	
C2002	1-162-291-31	CERAMIC	560PF	10%	50V	
C2004	1-124-963-11	ELECT	33MF	20%	16V	
C2005	1-161-054-00	CERAMIC	0.018MF	10%	50V	
C2006	1-124-465-00	ELECT	0.47MF	20%	50V	
C2007	1-102-124-00	CERAMIC	0.0039MF	10%	50V	
C2008	1-161-327-00	CERAMIC	0.0033MF	30%	50V	
C2009	1-124-446-11	ELECT	47MF	20%	10V	
C2010	1-123-875-11	ELECT	10MF	20%	50V	
C2013	1-161-053-00	CERAMIC	0.015MF	10%	50V	
C2015	1-126-094-11	ELECT	4.7MF	20%	35V	
C2016	1-124-791-11	ELECT	1MF	20%	100V	
C2017	1-124-963-11	ELECT	33MF	20%	16V	
C2018	1-126-094-11	ELECT	4.7MF	20%	35V	
C2019	1-124-126-00	ELECT	47MF	20%	25V	
C2020	1-162-286-31	CERAMIC	220PF	10%	50V	
C2021	1-130-309-00	FILM	0.033MF	5%	100V	
C2022	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C2024	1-161-051-00	CERAMIC	0.01MF	10%	50V	
C2025	1-161-494-00	CERAMIC	0.022MF	30%	25V	
C2030	1-124-791-11	ELECT	1MF	20%	100V	
C2031	1-124-791-11	ELECT	1MF	20%	100V	
C2032	1-124-791-11	ELECT	1MF	20%	100V	
C2033	1-124-963-11	ELECT	33MF	20%	16V	
C2034	1-124-791-11	ELECT	1MF	20%	100V	
C2042	1-161-021-11	CERAMIC	0.047MF	10%	25V	
C2045	1-161-044-00	CERAMIC	0.0027MF	10%	25V	
C2071	1-162-288-31	CERAMIC	330PF	10%	50V	
C2072	1-124-791-11	ELECT	1MF	20%	100V	
C2073	1-161-053-00	CERAMIC	0.015MF	10%	50V	
C2075	1-126-446-11	ELECT	3.3MF	20%	35V	
		CONNECTOR				
CN201	1-569-069-11	SOCKET 5P				
CN202	1-580-134-11	CONNECTOR 6P				
CN203	1-580-135-11	CONNECTOR 7P				
		DIODE				
D2002	8-719-911-19	DIODE 1SS119				
		IC				
IC201	1-808-886-11	IC LA7294				
IC202	8-759-800-81	IC LA7016				

Ref.No	Part No.	Description				Remark
		COIL				
L2001	1-410-092-31	INDUCTOR	27MMH			
L2002	- - -	INDUCTOR	68MMH			
L2003	1-412-271-11	COIL, CHOKE	560UH			
		TRANSISTOR				
Q2001	8-729-873-40	TRANSISTOR 2SD734-E				
		COIL				
T2001	1-406-366-11	COIL, OSC				
		VARIABLE RESISTOR				
VR201	1-241-205-11	SEMI VR 100KB				
VR202	1-228-955-11	RES, ADJ 10K				

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Ref.No	Part No.	Description				Remark
	*A-6725-915-A	VP-1 BOARD, COMPLETE *********************				
		TRANSISTOR				
B1801	8-729-805-45	TRANSISTOR 2SC3395				
B1802	8-729-805-45	TRANSISTOR 2SC3395				
		CAPACITOR				
C1801	1-162-203-31	CERAMIC	15PF	5%	50V	
C1802	1-162-203-31	CERAMIC	15PF	5%	50V	
C1803	1-162-211-31	CERAMIC	33PF	5%	50V	
C1804	1-162-211-31	CERAMIC	33PF	5%	50V	
C1805	1-161-375-00	CERAMIC	0.0022MF	20%	50V	
C1807	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C1808	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C1809	1-161-375-00	CERAMIC	0.0022MF	20%	50V	
C1811	1-161-375-00	CERAMIC	0.0022MF	20%	50V	
C1813	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C1814	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C1815	1-161-375-00	CERAMIC	0.0022MF	20%	50V	
C1817	1-124-438-00	ELECT	1MF	20%	50V	
C1818	1-161-020-11	CERAMIC	0.039MF	10%	25V	
C1819	1-124-438-00	ELECT	1MF	20%	50V	
C1822	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1830	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1831	1-162-294-31	CERAMIC	0.001MF	10%	50V	
C1832	1-162-294-31	CERAMIC	0.001MF	10%	50V	
C1833	1-162-294-31	CERAMIC	0.001MF	10%	50V	
C1834	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1835	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1836	1-126-154-11	ELECT	47MF	20%	6.3V	
C1839	1-162-214-31	CERAMIC	43PF	5%	50V	
C1841	1-162-215-31	CERAMIC	47PF	5%	50V	
C1843	1-162-211-31	CERAMIC	33PF	5%	50V	
C1844	1-161-379-00	CERAMIC	0.01MF	20%	25V	

When indicating parts by reference number, please include the board name.

VP-1 **VD-2**

Ref.No	Part No.	Description			Remark
C1845	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1846	1-161-020-11	CERAMIC	0.039MF	10%	25V
C1847	1-162-294-31	CERAMIC	0.001MF	10%	50V
C1848	1-161-494-00	CERAMIC	0.022MF	30%	25V
C1849	1-161-020-11	CERAMIC	0.039MF	10%	25V
C1850	1-126-154-11	ELECT	47MF	20%	6.3V
C1853	1-162-216-31	CERAMIC	51PF	5%	50V
C1863	1-162-288-31	CERAMIC	330PF	10%	50V
C1864	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1865	1-124-455-00	ELECT	100MF	20%	16V
C1867	1-164-080-11	CERAMIC	390PF	10%	50V
C1868	1-162-281-31	CERAMIC	91PF	10%	50V
		CONNECTOR			
CN181	- - -	8P			
CN182	- - -	6P			
CN183	1-580-138-11	SOCKET 3P			
CN184	1-580-139-11	SOCKET 2P			
CN186	- - -	7P			
		IC			
IC181	1-808-868-11	IC LA7321M			
		COIL			
L1803	1-410-521-11	INDUCTOR	100UH		
L1804	1-410-521-11	INDUCTOR	100UH		
L1806	1-410-517-11	INDUCTOR	47UH		
L1807	1-410-511-11	INDUCTOR	15UH		
L1808	1-410-511-11	INDUCTOR	15UH		
L1810	1-410-509-11	INDUCTOR	10UH		
L1813	1-410-521-11	INDUCTOR	100UH		
L1821	1-410-513-11	INDUCTOR	22UH		
L1824	1-410-519-11	INDUCTOR	68UH		
L1828	1-410-520-11	INDUCTOR	82UH		
		TRANSISTOR			
Q1801	8-729-901-78	TRANSISTOR 2SC2412K-R			
Q1802	1-809-104-11	TRANSISTOR 2SC2814-F4-TB			
Q1803	1-809-103-11	TRANSISTOR 2SA1037K-T96-R			
Q1804	1-809-104-11	TRANSISTOR 2SC2814-F4-TB			
Q1805	8-729-901-78	TRANSISTOR 2SC2412K-R			
Q1806	1-809-103-11	TRANSISTOR 2SA1037K-T96-R			
		VARIABLE RESISTOR			
VR181	1-237-500-21	RES, ADJ, CERMET 1K			
VR182	1-237-500-21	RES, ADJ, CERMET 1K			

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Ref.No	Part No.	Description			Remark
	*A-6725-916-A	VD-2 BOARD, COMPLETE **********************			
		TRANSISTOR			
B1201	8-729-900-89	TRANSISTOR DTC144ES			
		CAPACITOR			
C1201	1-161-063-00	CERAMIC	0.1MF	10%	50V
C1202	1-164-072-11	CERAMIC	120PF	5%	50V
C1203	1-162-211-31	CERAMIC	33PF	5%	50V
C1205	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1206	1-161-057-00	CERAMIC	0.033MF	10%	50V
C1207	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1208	1-124-126-00	ELECT	47MF	20%	25V
C1209	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1210	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1211	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1212	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1213	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1214	1-164-068-11	CERAMIC	82PF	5%	50V
C1215	1-162-219-31	CERAMIC	68PF	5%	50V
C1217	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1218	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1219	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1220	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1221	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1222	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1223	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1224	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1225	1-124-446-11	ELECT	47MF	20%	10V
C1227	1-124-446-11	ELECT	47MF	20%	10V
C1228	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1229	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1230	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1301	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1302	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1303	1-124-446-11	ELECT	47MF	20%	10V
C1306	1-124-443-00	ELECT	100MF	20%	10V
C1307	1-124-443-00	ELECT	100MF	20%	10V
C1308	1-126-446-11	ELECT	3.3MF	20%	35V
C1309	1-126-446-11	ELECT	3.3MF	20%	35V
C1310	1-126-094-11	ELECT	4.7MF	20%	35V
		CONNECTOR			
CN121	1-580-136-11	CONNECTOR 11P			
CN122	1-580-137-11	CONNECTOR 14P			
		DOIDE			
D1201	8-719-912-20	DIODE 1SS120			
D1203	8-719-912-20	DIODE 1SS120			
D1204	8-719-912-20	DIODE 1SS120			
D1205	8-719-912-20	DIODE 1SS120			
D1206	8-719-912-20	DIODE 1SS120			

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
D1207	8-719-912-20	DIODE 1SS120		
D1304	8-719-912-20	DIODE 1SS120		
D1305	8-719-912-20	DIODE 1SS120		
		DELAY LINE		
DL121	1-415-771-11	DELAY 2H		
DL122	1-415-772-11	DELAY LINE 1H		
DL123	1-415-757-11	DELAY 1H		
		FILTER		
F1201	1-236-909-11	FILTER 5.06MHZ 1.4M		
F1202	1-236-901-11	FILTER 4.43MHZ B.P.F		
F1203	1-236-903-11	FILTER 3.58MHZ B.P.F		
F1204	1-236-910-11	FILTER 1.4MHZ		
F1205	1-236-902-11	FILTER 4.21MHZ B.P.F		
		IC		
IC121	1-809-107-11	HIC		
IC131	8-759-804-59	IC LA7311		
		COIL		
L1201	1-410-520-11	INDUCTOR	82UH	
L1203	1-410-521-11	INDUCTOR	100UH	
L1204	1-410-511-11	INDUCTOR	15UH	
L1205	1-410-511-11	INDUCTOR	15UH	
L1206	1-410-521-11	INDUCTOR	100UH	
L1301	1-410-521-11	INDUCTOR	100UH	
		TRANSISTOR		
Q1201	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1202	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1203	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1205	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1206	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1207	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1208	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1209	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1210	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1211	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1212	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1213	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1214	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1215	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1216	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1217	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1218	8-729-119-78	TRANSISTOR 2SC2785-HFE		
Q1301	8-729-119-76	TRANSISTOR 2SA1175-HFE		
Q1302	8-729-119-76	TRANSISTOR 2SA1175-HFE		
Q1305	8-729-119-76	TRANSISTOR 2SA1175-HFE		
Q1306	8-729-119-76	TRANSISTOR 2SA1175-HFE		

Ref.No	Part No.	Description	Remark
		CRYSTAL	
X1201	1-577-667-11	CRYSTA, OSC (4.43MHz)	
X1202	1-579-082-11	CRYSTAL (3.58MHz)	

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*A-6725-917-A VD-1 BOARD, COMPLETE
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Ref.No	Part No.	Description				Remark
	1-162-194-31	CERAMIC	3.9PF	10%	50V	
		TRANSISTOR				
B1001	8-729-900-89	TRANSISTOR DTC144ES				
B1002	8-729-900-89	TRANSISTOR DTC144ES				
B1003	8-729-900-89	TRANSISTOR DTC144ES				
B1004	8-729-900-89	TRANSISTOR DTC144ES				
B1005	8-729-900-89	TRANSISTOR DTC144ES				
B1006	8-729-900-89	TRANSISTOR DTC144ES				
B1010	8-729-900-89	TRANSISTOR DTC144ES				
B1011	1-809-090-11	TRANSISTOR 2SC3400-AC				
B1012	8-729-900-89	TRANSISTOR DTC144ES				
		CAPACITOR				
C1001	1-124-234-00	ELECT	22MF	20%	16V	
C1002	1-124-257-00	ELECT	2.2MF	20%	50V	
C1003	1-123-875-11	ELECT	10MF	20%	50V	
C1004	1-124-257-00	ELECT	2.2MF	20%	50V	
C1005	1-162-816-11	CERAMIC CHIP	180PF	5%	50V	
C1006	1-162-219-31	CERAMIC	68PF	5%	50V	
C1007	1-162-198-31	CERAMIC	8.2PF	10%	50V	
C1008	1-164-064-11	CERAMIC	56PF	5%	50V	
C1009	1-124-446-11	ELECT	47MF	20%	10V	
C1010	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1011	1-162-292-31	CERAMIC	680PF	10%	50V	
C1012	1-162-209-31	CERAMIC	27PF	5%	50V	
C1013	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1015	1-162-210-31	CERAMIC	30PF	5%	50V	
C1016	1-162-207-31	CERAMIC	22PF	5%	50V	
C1017	1-101-880-00	CERAMIC	47PF	5%	50V	
C1018	1-162-210-31	CERAMIC	30PF	5%	50V	
C1019	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1020	1-164-064-11	CERAMIC	56PF	5%	50V	
C1021	1-162-201-31	CERAMIC	12PF	5%	50V	
C1026	1-162-208-31	CERAMIC	24PF	5%	50V	
C1027	1-162-215-31	CERAMIC	47PF	5%	50V	
C1051	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1052	1-161-063-00	CERAMIC	0.1MF	10%	50V	
C1053	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1054	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1055	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1056	1-124-831-11	ELECT	4.7MF	20%	25V	
C1057	1-124-438-00	ELECT	1MF	20%	50V	
C1058	1-124-126-00	ELECT	47MF	20%	25V	

When indicating parts by reference number, please include the board name.

VD-1

Ref.No	Part No.	Description			Remark
C1059	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1060	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1061	1-124-126-00	ELECT	47MF	20%	25V
C1062	1-162-212-31	CERAMIC	36PF	5%	50V
C1063	1-162-816-11	CERAMIC CHIP	180PF	5%	50V
C1064	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1065	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1066	1-164-064-11	CERAMIC	56PF	5%	50V
C1067	1-102-937-00	CERAMIC	4PF	0.25PF	50V
C1068	1-162-211-31	CERAMIC	33PF	5%	50V
C1069	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1070	1-126-094-11	ELECT	4.7MF	20%	35V
C1071	1-124-791-11	ELECT	1MF	20%	100V
C1072	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1073	1-124-126-00	ELECT	47MF	20%	25V
C1074	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1075	1-124-126-00	ELECT	47MF	20%	25V
C1076	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1077	1-161-494-00	CERAMIC	0.022MF	30%	25V
C1078	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1079	1-161-063-00	CERAMIC	0.1MF	10%	50V
C1080	1-161-494-00	CERAMIC	0.022MF	30%	25V
C1081	1-161-494-00	CERAMIC	0.022MF	30%	25V
C1082	1-161-494-00	CERAMIC	0.022MF	30%	25V
C1083	1-124-465-00	ELECT	0.47MF	20%	50V
C1101	1-161-039-00	CERAMIC	0.001MF	10%	50V
C1102	1-162-209-11	CERAMIC	27PF	5%	50V
C1103	1-161-039-00	CERAMIC	0.001MF	10%	50V
C1104	1-161-039-00	CERAMIC	0.001MF	10%	50V
C1105	1-161-039-00	CERAMIC	0.001MF	10%	50V
C1106	1-161-039-00	CERAMIC	0.001MF	10%	50V
C1107	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1108	1-124-126-00	ELECT	47MF	20%	25V
C1109	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1112	1-162-207-31	CERAMIC	22PF	5%	50V
C1113	1-162-211-31	CERAMIC	33PF	5%	50V
C1114	1-164-073-11	CERAMIC	100PF	10%	50V
C1115	1-162-207-31	CERAMIC	22PF	5%	50V
C1151	1-124-446-11	ELECT	47MF	20%	10V
C1152	1-124-442-00	ELECT	330MF	20%	6.3V
C1153	1-124-234-00	ELECT	22MF	20%	16V

CONNECTOR

Ref.No	Part No.	Description
CN101	1-580-137-11	CONNECTOR 14P
CN102	1-580-137-11	CONNECTOR 14P

DIODE

Ref.No	Part No.	Description
D1002	8-719-912-20	DIODE 1SS120
D1004	8-719-912-20	DIODE 1SS120
D1051	8-719-110-03	DIODE RD7.5ES-B2
D1052	8-719-110-13	DIODE RD9.1ES-B2
D1053	8-719-923-68	DIODE MTZJ-T-77-9.1C
D1054	8-719-110-03	DIODE RD7.5ES-B2

IC

Ref.No	Part No.	Description	Remark
IC101	1-808-099-11	DISPLAY PANEL, LIQUID CRYSTAL	
IC111	8-759-273-20	IC TA7320P	
IC112	1-808-885-11	IC TL8709P	
IC113	1-809-096-11	IC TL8708P	

COIL

Ref.No	Part No.	Description	
L1001	1-410-515-11	INDUCTOR	33UH
L1002	1-410-519-11	INDUCTOR	68UH
L1003	1-410-521-11	INDUCTOR	100UH
L1004	1-410-514-11	INDUCTOR	27UH
L1006	1-410-507-11	INDUCTOR	6.8UH
L1007	1-410-519-11	INDUCTOR	68UH
L1008	1-410-521-11	INDUCTOR	100UH
L1053	1-410-522-11	INDUCTOR	120UH
L1054	1-410-521-11	INDUCTOR	100UH
L1055	1-410-515-11	INDUCTOR	33UH
L1056	1-410-518-41	INDUCTOR	56UH
L1057	1-410-521-11	INDUCTOR	100UH
L1101	1-410-521-11	INDUCTOR	100UH
L1102	1-410-509-11	INDUCTOR	10UH
L1103	1-410-512-11	INDUCTOR	18UH

TRANSISTOR

Ref.No	Part No.	Description
Q1051	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q1052	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1053	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q1054	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q1055	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1056	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1101	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1102	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1151	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1152	8-729-140-97	TRANSISTOR 2SB734-34
Q1153	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1154	8-729-140-97	TRANSISTOR 2SB734-34
Q1155	8-729-140-97	TRANSISTOR 2SB734-34
Q1156	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q1157	8-729-140-97	TRANSISTOR 2SB734-34

VARIABLE RESISTOR

Ref.No	Part No.	Description
VR1151	1-237-500-21	RES, ADJ, CERMET 1K
VR152	1-237-500-21	RES, ADJ, CERMET 1K

CRYSTAL

Ref.No	Part No.	Description
X1101	1-579-090-11	CRYSTAL 3579.545KHZ

LC PACK

Ref.No	Part No.	Description
XF101	1-236-898-11	LC PACK 4.0MHZ

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When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
	*A-6725-918-A	CP-2 BOARD, COMPLETE *********************	
		TRANSISTOR	
B3801	8-729-900-89	TRANSISTOR DTC144ES	
B3802	1-809-090-11	TRANSISTOR 2SC3400-AC	
		CAPACITOR	
C3801	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3802	1-162-210-31	CERAMIC 30PF 5% 50V	
C3803	1-162-286-31	CERAMIC 220PF 10% 50V	
C3804	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3805	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3806	1-162-203-31	CERAMIC 15PF 5% 50V	
C3807	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3808	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3809	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3810	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3811	1-126-154-11	ELECT 47MF 20% 6.3V	
C3812	1-126-154-11	ELECT 47MF 20% 6.3V	
C3813	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C3814	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C7110	1-136-956-11	ELECT 47MF 55V	
C7301	1-162-210-31	CERAMIC 30PF 5% 50V	
C7302	1-162-210-31	CERAMIC 30PF 5% 50V	
C7303	1-124-234-00	ELECT 22MF 20% 16V	
C7304	1-161-063-00	CERAMIC 0.1MF 10% 50V	
		CONNECTOR	
CN381	- - -	4P	
CN382	- - -	5P	
CN738	- - -	3P	
CN751	- - -	15P	
CN752	- - -	3P	
CN753	- - -	6P	
		DIODE	
D7302	8-719-912-20	DIODE 1SS120	
		IC	
IC381	1-809-098-11	IC M50927-650SP	
IC731	1-809-102-11	IC CXP5014H-525S	
		COIL	
L3801	1-410-521-11	INDUCTOR 100UH	
L3802	1-410-511-11	INDUCTOR 15UH	
L3803	1-408-426-00	INDUCTOR 270UH	
L3804	1-410-512-11	INDUCTOR 18UH	
L3805	1-410-521-11	INDUCTOR 100UH	
		TRANSISTOR	
Q3801	8-729-884-02	TRANSISTOR 2SC2840	

Ref.No	Part No.	Description	Remark
Q3802	8-729-884-02	TRANSISTOR 2SC2840	
Q3803	8-729-884-02	TRANSISTOR 2SC2840	
Q3804	8-729-884-02	TRANSISTOR 2SC2840	
		FILTER	
X7301	1-236-616-11	FILTER	
		RESONATOR	
XF381	1-577-682-11	RESONATOR, CERAMIC	

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Ref.No	Part No.	Description	Remark
	*A-6725-919-A	TM-1 BOARD, COMPLETE *********************	
	*3-746-719-01	HOLDER	
		VFD	
A7101	1-519-564-11	VFD	
		TRANSISTOR	
B7101	1-809-094-11	TRANSISTOR DTC124EL-TL2	
B7102	1-809-094-11	TRANSISTOR DTC124EL-TL2	
B7103	1-809-094-11	TRANSISTOR DTC124EL-TL2	
		CAPACITOR	
C7101	1-162-199-31	CERAMIC 10PF 5% 50V	
C7102	1-162-207-31	CERAMIC 22PF 5% 50V	
C7103	1-162-207-31	CERAMIC 22PF 5% 50V	
C7104	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C7105	1-124-234-00	ELECT 22MF 20% 16V	
C7106	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C7107	1-161-379-00	CERAMIC 0.01MF 20% 25V	
C7108	1-124-465-00	ELECT 0.47MF 20% 50V	
C7111	1-161-063-00	CERAMIC 0.1MF 10% 50V	
C7113	1-126-157-11	ELECT 10MF 20% 16V	
		CONNECTOR	
CN711	- - -	15P	
CN712	- - -	9P	
CN713	- - -	6P	
CN714	- - -	9P	
CN715	- - -	5P	
		TRIMMER	
CT711	1-141-415-11		
		DIODE	
D7101	8-719-912-20	DIODE 1SS120	
D7102	8-719-912-20	DIODE 1SS120	
D7103	8-719-912-20	DIODE 1SS120	
D7104	8-719-912-20	DIODE 1SS120	
D7105	8-719-912-20	DIODE 1SS120	

When indicating parts by reference number, please include the board name.

TM-1 CP-A

Ref.No	Part No.	Description	Remark
D7106	8-719-912-20	DIODE 1SS120	
D7107	8-719-912-20	DIODE 1SS120	
D7108	8-719-912-20	DIODE 1SS120	
D7110	8-719-912-20	DIODE 1SS120	
D7123	8-719-912-20	DIODE 1SS120	
D7131	- - -	DIODE (PAL)	
D7132	- - -	DIODE (ME SECAN)	
D7133	- - -	DIODE (AUTO)	
D7134	- - -	DIODE (NTSC 4.43)	
D7135	- - -	DIODE (NTSC 3.58)	
D7136	- - -	DIODE (AUTO TR)	
D7137	- - -	DIODE (AUTO TR)	

IC

Ref.No	Part No.	Description	Remark
IC711	1-809-106-11	IC M50959-133SP	
IC712	8-759-403-39	IC MN1280-L	

SWITCH

Ref.No	Part No.	Description	Remark
S7101	1-572-415-11	PUSH SWITCH (PLAY)	
S7102	1-572-415-11	PUSH SWITCH (STOP)	
S7103	1-572-415-11	PUSH SWITCH (PAUSE)	
S7104	1-572-415-11	PUSH SWITCH (TAPE SPEED)	
S7106	1-572-415-11	PUSH SWITCH (CH UP)	
S7108	1-572-415-11	PUSH SWITCH (TR +/FT +)	
S7113	1-572-415-11	PUSH SWITCH (REC)	
S7114	1-572-415-11	PUSH SWITCH (EJECT)	
S7118	1-572-415-11	PUSH SWITCH (CH DOWN)	
S7120	1-572-415-11	PUSH SWITCH (TR -/FT -)	
S7125	1-572-415-11	PUSH SWITCH (REW)	
S7126	1-572-415-11	PUSH SWITCH (FF)	
S7129	1-572-415-11	PUSH SWITCH (PRISET)	
S7130	1-572-415-11	PUSH SWITCH (OK)	
S7137	1-572-415-11	PUSH SWITCH (ALL CLEAR)	

CRYSTAL

Ref.No	Part No.	Description	Remark
X7102	1-577-676-11	CRYSTAL	
X7104	1-578-065-11	CRYSTAL	

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***A-6725-920-A CP-A BOARD, COMPLETE**

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Part No.	Description
1-569-138-11	TERMINAL
3-749-092-01	WASHER, FIBER
*3-749-098-01	HOLDER (AD)
*3-749-102-01	HOLDER (VD-1, VD-2)

TRANSISTOR

Ref.No	Part No.	Description	Remark
B1701	8-729-900-89	TRANSISTOR DTC144ES	
B1702	1-809-087-11	TRANSISTOR 2SA1348-AC	
B1703	1-809-087-11	TRANSISTOR 2SA1348-AC	
B1704	8-729-900-89	TRANSISTOR DTC144ES	
B1706	8-729-900-89	TRANSISTOR DTC144ES	
B3501	8-729-900-89	TRANSISTOR DTC144ES	
B3502	8-729-900-89	TRANSISTOR DTC144ES	
B3601	8-729-900-89	TRANSISTOR DTC144ES	
B3602	8-729-900-65	TRANSISTOR DTA144ES	
B3603	8-729-900-89	TRANSISTOR DTC144ES	
B3901	8-729-900-89	TRANSISTOR DTC144ES	
B3902	8-729-900-65	TRANSISTOR DTA144ES	
B3903	8-729-900-65	TRANSISTOR DTA144ES	
B3904	8-729-900-89	TRANSISTOR DTC144ES	
B3905	8-729-900-89	TRANSISTOR DTC144ES	
B3906	8-729-900-89	TRANSISTOR DTC144ES	
B3907	8-729-900-65	TRANSISTOR DTA144ES	
B5401	8-729-900-65	TRANSISTOR DTA144ES	
B7301	8-729-900-65	TRANSISTOR DTA144ES	
B7302	8-729-900-89	TRANSISTOR DTC144ES	

CAPACITOR

Ref.No	Part No.	Description				Remark
C1701	1-124-791-11	ELECT	1MF	20%	100V	
C1702	1-124-234-00	ELECT	22MF	20%	16V	
C1703	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1704	1-126-114-11	ELECT	470MF	20%	6.3V	
C1705	1-124-446-11	ELECT	47MF	20%	10V	
C1706	1-124-446-11	ELECT	47MF	20%	10V	
C1707	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1708	1-124-443-00	ELECT	100MF	20%	10V	
C1709	1-124-126-00	ELECT	47MF	20%	25V	
C1710	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1711	- - -	ELECT	100MF	20%	25V	
C1712	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C1715	1-101-006-00	CERAMIC	0.043MF		50V	
C1716	1-124-126-00	ELECT	47MF	20%	25V	
C1717	1-101-006-00	CERAMIC	0.047MF		50V	
C1718	1-161-494-00	CERAMIC	0.022MF	30%	25V	
C3041	1-161-039-00	CERAMIC	0.001MF	10%	50V	
C3042	1-126-155-11	ELECT	100MF	20%	6.3V	
C3043	1-161-772-11	CERAMIC	0.1MF	10%	25V	
C3044	1-161-772-11	CERAMIC	0.1MF	10%	25V	
C3051	1-162-286-31	CERAMIC	220PF	10%	50V	
C3072	1-161-063-00	CERAMIC	0.1MF	10%	50V	
C3073	1-126-114-11	ELECT	470MF	20%	6.3V	
C3074	1-162-211-31	CERAMIC	33PF	5%	50V	
C3075	1-162-211-31	CERAMIC	33PF	5%	50V	
C3076	1-161-772-11	CERAMIC	0.1MF	10%	25V	
C3078	1-124-229-00	ELECT	33MF	20%	6.3V	
C3081	1-161-379-00	CERAMIC	0.01MF	20%	25V	
C3082	1-161-063-00	CERAMIC	0.1MF	10%	50V	
C3083	1-124-257-00	ELECT	2.2MF	20%	50V	
C3201	1-124-234-00	ELECT	22MF			
C3501	1-130-487-00	MYLAR	0.022MF	5%	50V	
C3503	1-161-329-00	CERAMIC	0.0068MF	30%	25V	
C3505	1-161-053-00	CERAMIC	0.015MF	10%	50V	
C3506	1-124-234-00	ELECT	22MF	20%	16V	
C3507	1-124-234-00	ELECT	22MF	20%	16V	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C3508	1-161-375-00	CERAMIC	0.0022MF	20%	50V
C3509	1-161-374-11	CERAMIC	0.0015MF	20%	16V
C3510	1-161-329-00	CERAMIC	0.0068MF	30%	25V
C3511	1-124-234-00	ELECT	22MF	20%	16V
C3512	1-124-234-00	ELECT	22MF	20%	16V
C3513	1-130-484-00	MYLAR	0.012MF	5%	50V
C3514	1-162-286-31	CERAMIC	220PF	10%	50V
C3515	1-126-157-11	ELECT	10MF	20%	16V
C3516	1-126-162-11	ELECT	3.3MF	20%	50V
C3517	1-162-290-31	CERAMIC	470PF	10%	50V
C3518	1-124-292-00	ELECT	33MF	20%	6.3V
C3519	1-162-294-31	CERAMIC	0.001MF	10%	50V
C3520	1-130-490-11	MYLAR	0.039MF	5%	50V
C3521	1-161-329-00	CERAMIC	0.0068MF	30%	25V
C3522	1-130-495-00	MYLAR	0.1MF	5%	50V
C3523	1-130-496-00	MYLAR	0.12MF	5%	50V
C3526	1-124-499-11	ELECT	1MF	20%	50V
C3527	1-161-379-00	CERAMIC	0.01MF	20%	25V
C3528	1-124-464-11	ELECT	0.22MF	20%	50V
C3529	1-161-039-00	CERAMIC	0.001MF	10%	50V
C3530	1-124-438-00	ELECT	1MF	20%	50V
C3531	1-161-379-00	CERAMIC	0.01MF	20%	25V
C3533	1-126-154-11	ELECT	47MF	20%	6.3V
C3534	- - -		0.1MF		
C3537	1-126-154-11	ELECT	47MF	20%	6.3V
C3538	1-126-154-11	ELECT	47MF	20%	6.3V
C3539	1-161-061-11	CERAMIC	0.068MF	10%	25V
C3540	1-106-359-00	MYLAR	0.0047MF	5%	50V
C3541	1-161-039-00	CERAMIC	0.001MF	10%	50V
C3601	1-130-491-00	MYLAR	0.047MF	5%	50V
C3602	1-130-495-00	MYLAR	0.1MF	5%	50V
C3603	1-130-495-00	MYLAR	0.1MF	5%	50V
C3604	1-130-495-00	MYLAR	0.1MF	5%	50V
C3605	1-161-379-00	CERAMIC	0.01MF	20%	25V
C3606	1-124-499-11	ELECT	1MF	20%	50V
C3607	1-108-793-11	MYLAR	0.0012MF	5%	50V
C3901	1-126-157-11	ELECT	10MF	20%	16V
C3902	1-162-207-31	CERAMIC	22PF	5%	50V
C3903	1-162-287-31	CERAMIC	270PF	10%	50V
C3904	1-162-282-31	CERAMIC	100PF	10%	50V
C3905	1-162-211-31	CERAMIC	33PF	5%	50V
C3906	1-161-379-00	CERAMIC	0.01MF	20%	25V
C3907	1-161-379-00	CERAMIC	0.01MF	20%	25V
C3908	1-161-379-00	CERAMIC	0.01MF	20%	25V
C3909	1-162-289-31	CERAMIC	390PF	10%	50V
C5401	1-161-379-00	CERAMIC	0.01MF	20%	25V
C6001	1-136-165-00	FILM	0.1MF	5%	50V
C6002	1-126-094-11	ELECT	4.7MF	20%	35V
C6003	1-124-791-11	ELECT	1MF	20%	100V
C6004	1-136-165-00	FILM	0.1MF	5%	50V
C6005	1-126-094-11	ELECT	4.7MF	20%	35V
C6006	1-124-036-11	ELECT	330MF	20%	16V
C6007	1-161-494-00	CERAMIC	0.022MF	30%	25V

Ref.No	Part No.	Description			Remark
C6601	1-124-443-00	ELECT	100MF	20%	10V
C6602	1-124-443-00	ELECT	100MF	20%	10V
C7001	1-161-379-00	CERAMIC	0.01MF	20%	25V
C7002	1-161-379-00	CERAMIC	0.01MF	20%	25V
C7003	1-161-063-00	CERAMIC	0.1MF	10%	50V
C7004	1-124-916-11	ELECT	22MF	20%	63V
C7005	1-102-976-00	CERAMIC	180PF	5%	50V
C7006	1-136-165-00	FILM	0.1MF	5%	50V
C7007	1-136-502-11	MYLAR	0.33MF	5%	50V
C7303	1-123-875-11	ELECT	10MF	20%	50V
C7304	1-124-252-00	ELECT	0.33MF	20%	50V
C7305	1-161-375-00	CERAMIC	0.0022MF	20%	50V
C7306	1-161-039-00	CERAMIC	0.001MF	10%	50V
C7307	1-124-234-00	ELECT	22MF	20%	16V
C7308	1-161-063-00	CERAMIC	0.1MF	10%	50V
		CONNECTOR			
CN165	*1-569-747-11	SOCKET	3P		
CN167	1-569-071-11	SOCKET	6P		
CN172	1-580-011-11	SOCKET	8P		
CN173	1-569-069-11	SOCKET	5P		
CN202	- - -		6P		
CN203	- - -		7P		
CN301	1-580-131-11	SOCKET	26P		
CN302	*1-569-747-11	SOCKET	3P		
CN310	*1-569-747-11	SOCKET	3P		
CN320	- - -		4P		
CN351	*1-569-747-11	SOCKET	3P		
CN359	1-580-132-11	SOCKET	5P		
CN360	- - -		5P		
CN541	1-569-071-11	SOCKET	6P		
CN701	1-569-068-11	SOCKET	9P		
CN734	1-569-071-11	SOCKET	6P		
CN851	- - -		8P		
CN852	- - -		7P		
		DIODE			
D1701	8-719-912-20	DIODE	1SS120		
D1702	8-719-912-20	DIODE	1SS120		
D1703	8-719-912-20	DIODE	1SS120		
D1704	8-719-912-20	DIODE	1SS120		
D1705	8-719-912-20	DIODE	1SS120		
D1706	8-719-109-85	DIODE	RD5.1ESB2		
D1709	8-719-912-20	DIODE	1SS120		
D1710	8-719-912-20	DIODE	1SS120		
D1712	8-719-912-20	DIODE	1SS120		
D1713	8-719-911-19	DIODE	1SS119		
D2101	8-719-991-33	DIODE	1SS133T-77		
D2102	8-719-991-33	DIODE	1SS133T-77		
D3001	1-809-009-11	DIODE	1SS244-T-77		
D3005	8-719-911-19	DIODE	1SS119		
D3051	8-719-912-20	DIODE	1SS120		
D3081	8-719-110-08	DIODE	RD8.2ESB2		

When indicating parts by reference number, please include the board name.

CP-A

Ref.No	Part No.	Description	Remark
D3082	8-719-109-89	DIODE RD5.6ESB2	
D3131	8-719-912-20	DIODE 1SS120	
D3132	8-719-912-20	DIODE 1SS120	
D3501	8-719-912-20	DIODE 1SS120	
D3502	8-719-912-20	DIODE 1SS120	
D3503	8-719-912-20	DIODE 1SS120	
D3504	8-719-912-20	DIODE 1SS120	
D3505	8-719-912-20	DIODE 1SS120	
D3522	8-719-912-20	DIODE 1SS120	
D3553	8-719-912-20	DIODE 1SS120	
D3601	8-719-912-20	DIODE 1SS120	
D3602	8-719-912-20	DIODE 1SS120	
D3603	8-719-912-20	DIODE 1SS120	
D3604	8-719-912-20	DIODE 1SS120	
D3607	8-719-912-20	DIODE 1SS120	
D3608	8-719-912-20	DIODE 1SS120	
D3609	8-719-912-20	DIODE 1SS120	
D3610	8-719-912-20	DIODE 1SS120	
D3611	8-719-912-20	DIODE 1SS120	
D3612	8-719-912-20	DIODE 1SS120	
D3613	8-719-912-20	DIODE 1SS120	
D3615	8-719-912-20	DIODE 1SS120	
D3616	8-719-912-20	DIODE 1SS120	
D3617	8-719-912-20	DIODE 1SS120	
D3618	8-719-912-20	DIODE 1SS120	
D3621	8-719-912-20	DIODE 1SS120	
D3623	8-719-912-20	DIODE 1SS120	
D3624	8-719-912-20	DIODE 1SS120	
D3702	- - -	DIODE	
D3901	8-719-912-20	DIODE 1SS120	
D3902	8-719-912-20	DIODE 1SS120	
D3903	8-719-912-20	DIODE 1SS120	
D3904	8-719-912-20	DIODE 1SS120	
D3905	8-719-912-20	DIODE 1SS120	
D3906	8-719-912-20	DIODE 1SS120	
D5401	1-809-009-11	DIODE 1SS244-T-77	
D5402	8-719-921-42	DIODE MTZJ-5.1A	
D5403	1-809-009-11	DIODE 1SS244-T-77	
D5450	- - -	DIODE 1SS244	
D6601	8-719-300-45	DIODE EM-1Z	
D6602	8-719-912-20	DIODE 1SS120	
D6603	8-719-912-20	DIODE 1SS120	
D7001	8-719-912-20	DIODE 1SS120	
D7002	8-719-921-60	DIODE MTZJ-6.8C	

LC PACK

Ref.No	Part No.	Description	Remark
F1171	1-236-897-11	LC PACK	

IC

Ref.No	Part No.	Description	Remark
IC171	8-759-927-56	IC BA7021	
IC301	1-809-101-11	IC LC66512A-3919	
IC302	8-759-822-09	IC LB1641	
IC303	- - -	IC LA6393S	
IC306	8-759-403-44	IC MN1280-S	
IC351	1-809-105-11	IC LC7418-8078	
IC352	1-808-874-11	IC LA7122S	
IC701	1-808-855-11	IC M6M80021P	
IC702	8-759-800-65	IC LA7910	
IC703	8-759-157-40	IC UPC574J	
IC731	1-808-849-11	IC LA7214	

COIL

Ref.No	Part No.	Description		Remark
L1701	1-410-521-11	INDUCTOR	100UH	
L1702	1-410-521-11	INDUCTOR	100UH	
L1703	1-410-521-11	INDUCTOR	100UH	
L3901	1-410-521-11	INDUCTOR	100UH	
L3902	1-410-515-11	INDUCTOR	33UH	
L6001	1-410-316-11	INDUCTOR	1UH	
L6002	1-410-316-11	INDUCTOR	1UH	
L6003	1-410-316-11	INDUCTOR	1UH	
L6004	1-410-316-11	INDUCTOR	1UH	
L6005	1-410-316-11	INDUCTOR	1UH	
L6006	1-410-316-11	INDUCTOR	1UH	
L6007	1-410-521-11	INDUCTOR	100UH	
L6008	1-410-316-11	INDUCTOR	1UH	
L6009	1-410-316-11	INDUCTOR	1UH	
L6010	1-410-316-11	INDUCTOR	1UH	
L6011	1-410-316-11	INDUCTOR	1UH	
L6601	1-408-411-00	INDUCTOR	15UH	
L6602	1-408-411-00	INDUCTOR	15UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1703	1-809-093-11	TRANSISTOR 2SC3807	
Q1704	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1705	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1706	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1707	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1708	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1709	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1710	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1712	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1713	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3501	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3503	1-809-092-11	TRANSISTOR 2SD734-F-AA	
Q3602	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3603	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3901	8-729-884-02	TRANSISTOR 2SC2840-D	
Q3902	8-729-884-02	TRANSISTOR 2SC2840-D	
Q3903	8-729-884-02	TRANSISTOR 2SC2840-D	
Q5401	1-809-088-11	TRANSISTOR 2SB544-F-MP-AE	
Q5402	8-729-800-34	TRANSISTOR 2SC3070	
Q7001	1-809-089-11	TRANSISTOR 2SC2960-F	
Q7002	8-729-140-97	TRANSISTOR 2SB734-34	
Q7003	8-729-103-12	TRANSISTOR 2SK68A-M	
Q7303	8-729- -	TRANSISTOR 2SK68A-K	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark

NETWORK RESISTOR

Ref.No	Part No.	Description	Remark
RB301	1-236-900-11	RESISTOR NETWORK 4.7KX3	
RB302	1-236-899-11	RESISTOR NETWORK 3.9KX3	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
VR351	1-228-998-00	RES, ADJ, METAL GLAZE 200K	
VR352	1-228-998-00	RES, ADJ, METAL GLAZE 200K	
VR361	1-241-206-11	SEMI 200KB	
VR362	1-241-206-11	SEMI 200KB	

CRYSTAL

Ref.No	Part No.	Description	Remark
X3901	1-579-090-11	CRYSTAL (3.58MHz)	

CERAMIC

Ref.No	Part No.	Description	Remark
XF301	1-577-668-11	RE, CERAMIC	

****

*A-6725-921-A TM-2 BOARD, COMPLETE
****

CONNECTOR

Ref.No	Part No.	Description	Remark
CN724	- - -	9P	
CN795	- - -	3P	

DIODE

Ref.No	Part No.	Description	Remark
D7181	1-809-068-11	DIODE SLV-31MC3F (POWER)	

RECIEVER

Ref.No	Part No.	Description	Remark
RR711	1-466-549-11	RECIEVER, REMOTE CONTROL	

SWITCH

Ref.No	Part No.	Description	Remark
S7115	1-572-415-11	PUSH SWITCH (POWER)	
S7171	1-572-450-11	SWITCH, SLIDE (AUTO/NTSC 3.58/4.43)	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
VR771	1-241-161-11	VR ROTARY 10K (PICTURE)	

****

MISCELLANEOUS
****

Ref.No	Part No.	Description	Remark
	A-6050-719-A	COMPLETE PCB, 2N4P CYLINDER	
	1-466-393-11	MODULATOR, RF	
	1-572-383-11	SWITCH, ROTARY	
	⚠.1-590-005-11	CORD, PWOER	
	1-808-710-11	PHOTO TRANSISTOR (PN150SAN)	
	1-808-722-11	DIODE LN59 (LED)	
	3-735-711-01	SENSOR ASSY, DEW	
	3-735-729-01	SW, LEAF	
	3-735-687-01	HEAD, FTE	
	3-749-090-01	CAPSTAN, MOTOR	

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
1-465-547-11	REMOTE COMMANDER (5 GANG)	
1-580-133-11	PLUG (AC SOCKET)	
3-749-104-01	CABLE, ANT	
*3-749-109-01	CUSHION (FRONT)	
*3-749-110-01	CUSHION (BACK)	
*3-749-118-01	INDIVIDUAL CARTON	
3-752-150-01	MANUAL, INSTRUCTION (ENGLISH, SPANISH, ARABIC)	

****

HARDWARE LIST
****

SCREW

Part No.	Description
7-621-759-45	+PSW, 2.6X6
7-621-775-08	SCREW +P 2.6X3
7-621-775-10	SCREW +B 2.6X4
7-621-775-20	SCREW +B 2.6X5
7-682-547-09	SCREW +B 3X6
7-682-947-01	SCREW +PSW 3X6
7-685-131-19	SCREW +BTP 2.6X4 TYPE2 N-S
7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S
7-685-647-79	SCREW +BTP 3X10 TYPE2 N-S
7-685-645-79	SCREW +BVTP 3X6 TYPE2 SLIT
7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S
7-685-647-79	SCREW +BVTP 3X10 TYPE2 SLIT
7-685-661-19	SCREW +BVTP 4X12 TYPE2 N-S

SET-SCT

Part No.	Description
7-621-732-08	SET-SCT, HEX. 2X3 FLAT POINT

STOP RING

Part No.	Description
7-624-105-04	STOP RING 2.3, TYPE -E

WASHER

Part No.	Description
7-688-001-01	W 2, SMALL

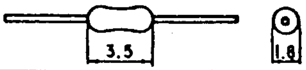
****

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Description

5% 1/4W A
CARBON RESISTOR 5% 1/4W



Value	Part. No.	Value	Part. No.	Value	Part. No.	Value	Part. No.	Value	Part. No.	Value	Part. No.
0.22Ω		11Ω	1-247-784-00	200Ω	1-247-814-11	3.6kΩ	1-247-844-11	62kΩ	1-247-874-11	1.2MΩ	
0.27Ω		12Ω	1-249-394-11	220Ω	1-249-409-11	3.9kΩ	1-249-424-11	68kΩ	1-249-439-11	1.5MΩ	
0.33Ω		13Ω	1-247-786-11	240Ω	1-247-816-11	4.3kΩ	1-247-846-11	75kΩ	1-247-876-11	1.8MΩ	
0.39Ω		15Ω	1-249-395-11	270Ω	1-249-410-11	4.7kΩ	1-249-425-11	82kΩ	1-249-440-11	2.0MΩ	
0.47Ω	1-249-377-11	16Ω	1-247-788-00	300Ω	1-247-818-11	5.1kΩ	1-247-848-11	91kΩ	1-247-878-00	2.2MΩ	1-259-880-11
0.56Ω	1-249-378-11	18Ω	1-249-396-11	330Ω	1-249-411-11	5.6kΩ	1-249-426-11	100kΩ	1-249-441-11	2.7MΩ	
0.68Ω	1-249-379-11	20Ω	1-247-790-11	360Ω	1-247-820-11	6.2kΩ	1-247-850-11	110kΩ	1-247-880-11	3.3MΩ	
0.82Ω	1-249-380-11	22Ω	1-249-397-11	390Ω	1-249-412-11	6.8kΩ	1-249-427-11	120kΩ	1-247-881-00	3.9MΩ	
1.0Ω	1-249-381-11	24Ω	1-247-792-11	430Ω	1-247-822-11	7.5kΩ	1-247-852-11	130kΩ	1-247-882-11	4.7MΩ	
1.2Ω	1-249-382-11	27Ω	1-249-398-11	470Ω	1-249-413-11	8.2kΩ	1-249-428-11	150kΩ	1-247-883-00	5.6MΩ	
1.5Ω	1-249-383-11	30Ω	1-247-794-11	510Ω	1-249-442-11	9.1kΩ	1-247-854-11	160kΩ	1-247-884-11	6.8MΩ	
1.6Ω		33Ω	1-249-399-11	560Ω	1-249-414-11	10kΩ	1-249-429-11	180kΩ	1-247-885-00	8.2MΩ	
1.8Ω	1-249-384-11	36Ω	1-247-796-11	620Ω	1-247-826-00	11kΩ	1-247-856-00	200kΩ	1-247-886-11	10MΩ	
2.2Ω	1-249-385-11	39Ω	1-249-400-11	680Ω	1-249-415-11	12kΩ	1-249-430-11	220kΩ	1-247-887-00	12MΩ	
2.4Ω	1-247-768-00	43Ω	1-247-798-11	750Ω	1-247-828-11	13kΩ	1-247-858-11	240kΩ	1-247-888-11	15MΩ	
2.7Ω	1-249-386-11	47Ω	1-249-401-11	820Ω	1-249-416-11	15kΩ	1-249-431-11	270kΩ	1-247-889-00	18MΩ	
3.0Ω	1-247-770-00	51Ω	1-247-800-11	910Ω	1-247-830-11	16kΩ	1-247-860-11	300kΩ	1-247-890-11	22MΩ	
3.3Ω	1-249-387-11	56Ω	1-249-402-11	1.0kΩ	1-249-417-11	18kΩ	1-249-432-11	330kΩ	1-247-891-00		
3.6Ω	1-247-772-00	62Ω	1-247-802-11	1.1kΩ	1-247-832-11	20kΩ	1-247-862-11	360kΩ	1-247-892-11		
3.9Ω	1-249-388-11	68Ω	1-249-403-11	1.2kΩ	1-249-418-11	22kΩ	1-249-433-11	390kΩ	1-247-893-11		
4.3Ω	1-247-774-00	75Ω	1-247-804-11	1.3kΩ	1-247-834-11	24kΩ	1-247-864-11	430kΩ	1-247-894-11		
4.7Ω	1-249-389-11	82Ω	1-249-404-00	1.5kΩ	1-249-419-11	27kΩ	1-249-434-11	470kΩ	1-247-895-00		
5.1Ω	1-247-776-00	91Ω	1-247-806-11	1.6kΩ	1-247-836-11	30kΩ	1-247-866-11	510kΩ	1-247-896-11		
5.6Ω	1-249-390-11	100Ω	1-249-405-11	1.8kΩ	1-249-420-11	33kΩ	1-249-435-11	560kΩ	1-247-897-11		
6.2Ω	1-247-778-00	110Ω	1-247-808-11	2.0kΩ	1-247-838-00	36kΩ	1-247-868-11	620kΩ	1-247-898-11		
6.8Ω	1-249-391-11	120Ω	1-249-406-11	2.2kΩ	1-249-421-11	39kΩ	1-249-436-11	680kΩ	1-247-899-11		
7.5Ω	1-247-780-00	130Ω	1-247-810-11	2.4kΩ	1-247-840-00	43kΩ	1-247-870-11	750kΩ	1-247-900-11		
8.2Ω	1-249-392-11	150Ω	1-249-407-11	2.7kΩ	1-249-422-11	47kΩ	1-249-437-11	820kΩ	1-247-901-11		
9.1Ω	1-247-782-00	160Ω	1-247-812-11	3.0kΩ	1-247-842-11	51kΩ	1-247-872-11	910kΩ	1-247-902-11		
10Ω	1-249-393-11	180Ω	1-249-408-11	3.3kΩ	1-249-423-11	56kΩ	1-249-438-11	1.0MΩ	1-247-903-00		

Sony Corporation
Home Video Group

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